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**THE BEARINGS OF MODERN
PSYCHOLOGY ON EDUCATIONAL
THEORY AND PRACTICE**

**THE PSYCHOLOGY
OF THE FREE CHILD**

BY
CHRISTABEL M. MEREDITH

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MODERN PSYCHOLOGY
ON EDUCATIONAL THEORY
AND PRACTICE**



BY

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PREFACE

THE aim of this book is to give a brief account of some portions of recent psychological work which have had and are likely to have a special influence on education. Part I is concerned mainly with genetic psychology : instincts, the growth of habit, and the effect of environment and suggestion. In selecting these topics for discussion it is not of course claimed that the views involved are wholly modern, some of them have formed the basis of educational theory for several generations. Much of the permanent value, for example, of Froebel's work is due to his recognition of certain innate impulses in children of which the teacher must make use, and some of Rousseau's statements concerning child nature and the influence of environment might well have been written to-day. What is intended is rather to summarise the theories as they now stand and to show their bearing on what is being and can be done in education. The topics selected have been chosen because of their fundamental importance in this connection.

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Part II is concerned with some special studies in educational psychology and in particular with experimental work. Here it has been thought better to pick out certain points for discussion as illustrative of the work that is being done rather than to attempt any general summary of results.

Some portions of the substance of Chapters I, II, and III appeared in articles published in "Child Life"; and parts of Chapter V were embodied in a paper presented to the Education Section of the British Association.

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The Bearings of Modern Psychology on Educational Theory and Practice

NAWAB SALAR JUNG RAHADUR.

Part I

CHAPTER I

THE NATURE OF INSTINCT

THE study of instinct in animals, including man, has led to important changes in modern educational theory, and though the corresponding changes in educational practice are necessarily slower they are now becoming more widely evident. The importance to the teacher of some knowledge of what is meant by instinct can hardly be exaggerated. All the child's activities depend primarily on instinct and its developments, and all teaching must continually avail itself of these activities. It would be rash to offer any definition of education in a book of this size, but it will readily be agreed that one, at least, of the educator's aims is that his pupils shall behave in a certain way when faced by certain stimuli. He wants the pupil, when presented with a multiplication sum, to behave in the particular way known as multiplying, and when con-

fronted with a comrade in distress to behave in the particular way known as sympathetic and helpful. The child's instinctive tendencies are the teacher's starting point in influencing behaviour for the simple reason that no other starting point is available. Good teachers have always appealed to them although they have not always recognised that they were doing so. The lack of knowledge is dangerous, however, in that certain instincts are more productive for the teacher's purpose than others, and also because various non-natural activities can be stimulated by an appeal to such an instinct as fear, the semi-paralysing effects of which are calculated in the end to defeat the teacher's real aim.

The older view was, to put it briefly, that instinct belonged to the lower animals and reason to man. Human instincts, so far as they existed, were at the best undignified and at the worst improper, and the object of education was to teach the child to overcome them or at least to keep them in subjection. Some remnants of this view still survive in the prejudice which appears even in recent books on education against the term instinct. Some writers prefer to term man's 'higher' impulses spiritual, his 'lower' instinctive—a distinction that can hardly be maintained without confusion of thought. In fact we are now bound to recognise that reasoning powers, morality and all that we most respect in man develop out of the child's instinctive tendencies, and that the germs of some at least of these 'higher' impulses can be found in animals. The business of the teacher is first to find out what these tendencies are and then by pro-

viding suitable material for their exercise, by suggestion and by help in various ways, to see that the resulting activities are educational. The giving of information, the encouragement of thought, and the stimulus to unselfish activities must all be based on this study of instinct.

Various definitions have been given of instinct, but we may here be content to enumerate the distinctive features which characterise instinctive action, following in the main McDougall's treatment of the subject.

In the first place, then, instincts are inherited or innate dispositions, i.e. they are part of the child's natural endowment and not the result of his nurture or education. This does not, of course, mean that all instinctive tendencies appear at or very shortly after birth, though the majority of them can be traced back to the first year of the child's life. It does however mean that instinctive action is unlearned and arises naturally in response to the proper stimulus. A chicken just hatched apparently pecks at its food by instinct, and young spiders make webs from the same cause.

Secondly, these inherited dispositions enable, or more strictly speaking, oblige their possessor to be aware of and to pay attention to those objects which, as we say, stimulate the instinct. A dog can and must pay attention to the presence of a rat of which his master is quite unaware. In somewhat the same way children are keenly aware of the presence of unopened boxes or parcels which stimulate their curiosity, but which their father, with curiosity damped by larger experience, hardly notices.

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Thirdly, the perception of the object tends to have two results. It arouses in the perceiver the specific emotion which is a component part of the instinct stimulated, and it causes him to act, or to desire very strongly to act, in a certain more or less definite way. Thus we can distinguish three factors in the whole instinctive process. The stimulus, the emotion which accompanies the perception of the stimulus, and the reaction which follows. To refer again to the example given above: the dog sees or smells the rat, at once becomes violently excited, and tries eagerly to catch and kill it: all which we may explain by saying that the sight or smell of the rat arouses his hunting instinct. For the observer the connection between stimulus and reaction is usually the most noticeable feature, but to the individual whose instincts are stimulated the emotion is apt to be so strong as to overshadow everything else, and the reaction is sometimes carried out almost unconsciously. This fact is evident enough to introspection, and in connection with it should be noted the sense of fitness and inevitableness which is often one of the most marked characteristics of instinctive actions from the point of view of the individual performing them. Children, if they were able readily to analyse and express their feelings, might not unreasonably ask "How could I have done anything else?" when their elders inquire "why" they behaved so violently or so absurdly in a fit of anger or shyness. And indeed to reason with a child or adult who is excited by a strong instinctive emotion is generally waste of time. Reason must do

its work either before or after the event. In later life, it is true that since we all render some degree of lip-service to reason we often supply grounds for our instinctive actions afterwards, when we reflect upon them, and most people can convince themselves, if not their friends, that such actions were in reality reasoned out. In fact, however, reasoned actions proper are marked by a degree of deliberation and often of hesitancy quite foreign to instinctive actions. Of course many instinctive actions are quite reasonable in the sense that excellent reasons can be found for them and that they may be what we should have done had we stopped to think ; but that is a different matter and does not justify us in asserting that we did think.

Certain features of the instinctive process are of special importance to the teacher. The first of these is connected with the appeal made by the stimuli which arouse the corresponding instinct. Such stimuli are, as it were, appropriate to the organism and are readily perceived, although they may not seem specially noticeable to others. Or rather not only are they readily perceived but they cannot be ignored. The dog's perception of a cat or a rabbit, the sea-gull's perception of food thrown on the water, the butterfly's choice of a suitable leaf for its eggs are all instances of the same thing. Hence it follows that the teacher who uses material which appeals to a child's instincts need make little effort to secure attention ; that comes of itself. In fact the more directly the instinct is appealed to the less the child can help attending. We are all familiar with this in connection with nursery

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management, where the intelligent nurse keeps the new toys to give the baby when she is busy or on a wet afternoon, and the same thing is true in the schoolroom if we allow for the modifications of instinct by experience, with which we shall have to deal later. On the other hand, distractions from the subject in hand may also appeal to instinct. Few children, for instance, can attend to other things while their curiosity is stimulated by the sounds of a band in the street outside, and most teachers know that it is better to give up a few minutes to satisfying this curiosity than to waste the lesson in fruitless protests.

In the next place, the teacher must realise that the child's behaviour under the influence of instinctive emotion is, in early years especially and to some extent all through life, unreasoning, 'blind,' 'irresponsible,' or whatever similar word we like to apply to it. The child's physical organism supplies the suitable reaction and, as we have seen, his emotional feeling is too strong and engrossing to allow him to reflect. To blame a child for being angry may be justified as one way of showing him that anger is 'unsocial' and is disapproved of, and thus giving him a motive to self-control. But the blame should be connected with the anger and not measured by the amount of damage done, which is after all chiefly the result of chance.

Finally the teacher has to recognise the strength of the instinctive impulse and to understand the difficulty of thwarting or suppressing it. To guide it by stimulation in another and more desired direction is a much

easier matter. Many children, for instance, are destructive of toys and other things either from curiosity or from clumsy attempts at construction: to stop this directly is almost impossible, but it may be turned into harmless and even useful directions by giving them waste paper and other materials which can be torn up, by helping them when possible to take their toys to pieces and reconstruct them, and by the provision of suitable toys that will stand experimental treatment. If, however, a case arises where the instinctive tendency needs to be checked rather than directed this can only be done effectively by arousing another force as strong as itself, i.e. by appeal to another instinct. Fortunately for the teacher some instincts naturally tend to check and counteract one another and can be legitimately made use of in this way by the educator. The nurse who tries to persuade an angry baby to stop crying by knocking on its cot or offering it a new toy is justified in that she is appealing to one instinct, curiosity, to overcome another, anger. A child's fear of a strange object may be overcome by its curiosity to find out what it is like. Or again, fear of animals may be overcome by the help of the protective instinct, as when a child is given perhaps a young and obviously harmless dog to look after and learns to understand other dogs in the process. But if no way of directing usefully or counteracting an instinctive tendency can be found, and its effects as manifested are definitely harmful, the best method of procedure is often to avoid stimulating it as much as possible. Irritable children should be considerably treated

until improved health or more developed interests make them less liable to fits of anger. This is the real force of that much-neglected maxim : " Fathers, provoke not your children to wrath." This point is closely connected with the growth of habit and we shall have to return to it later.

We may now sum up briefly the standpoint of the teacher in respect to instinct. He must recognise that each child is prompted to action chiefly by its possession of instinctive tendencies. The young child will act in response to any stimulation of its instincts by appropriate objects, and will act in the way determined by the instinct. Throughout the process he will be intent, interested whether pleasurably or painfully, hardly if at all open to reason and with difficulty distracted from his purpose. This purpose however need not be the end of the action as we see it and indeed is generally something much more immediate. This seems obvious and yet we are still apt to tell a young child to run about " to keep himself warm " and to be surprised when we come out later and find him dabbling in a cold puddle.

Further, our knowledge of animal life and of the workings of instinct under more primitive conditions suggests that the best and most effective development can only come from the exercise and satisfaction of all the instincts to the fullest extent practicable under modern conditions. The domestic dog going for his walk, delightful creature though he is, is only half alive compared with the same dog when hunting rabbits. And for children too, the best and most complete develop-

ment comes from freely exercising their instincts and developing by this means powers of thought and wider interests. Here, however, a difficulty arises, not yet wholly understood. The child's instincts are his inheritance from primitive times when life was led under very different conditions and they are not all equally suited to life as it is to-day. Some of them seem almost wholly unsuited. Yet it is suggested that children and adults may suffer seriously from unsatisfied or 'balked' instincts, as Graham Wallas calls them, and that a strained and unstable nervous condition may result from lack of stimulus for such important primitive instincts as pugnacity and fear. Some educationalists indeed believe that the best environment for children up to about twelve years of age, would be one which reproduced primitive conditions to some extent and allowed a free life of hunting, fishing and outdoor games in a more or less rough country or sea-side district, with little direct teaching and little appeal at this stage to the more social and humane instincts. Children might thus satisfy some of their less 'civilised' instinctive tendencies at a time when they could do so without harm to themselves or their neighbours and with considerable benefit to their physical development. It is the less necessary to discuss this suggestion at length since it is obviously impracticable for the great majority of children, but the point of view which prompts it is sufficiently correct to deserve the teacher's sympathetic consideration and to determine him to provide at any rate some legitimate outlet for the wilder and more primitive instincts which

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are apt to be neglected or disapproved of. It may however be noted that these instincts can be at any rate partially satisfied under civilised conditions, and that the boy whose curiosity and love of adventure finds an outlet in the study of birds and animal life is as 'naturally,' and more intelligently, developed than the boy who has always a stone in his hand to throw at any living creature that may turn up, and there is no reason why the former boy should not grow up as manly and as good a 'sportsman' as the latter, though he may find less pleasure in mere killing for its own sake.

The practical outcome of all this study of instinct in children is the need for greater freedom in school life. The teacher must provide material and a suitable environment—this latter no easy task—must give help when needed and must be content to let the child work out its own salvation to a much greater extent than was formerly thought possible. This need for freedom is now widely recognised, but a further point still needs emphasis, and that is that freedom, to be really valuable, does not mean merely that all the children in the class are enjoying their work and do it willingly. A skilful teacher can produce this effect and yet teach what is not really suited to the child's stage of development. Instances of this are still to be found in infant schools where the teacher has to give lessons in such subjects as reading, writing or number whilst her pupils are still too young for them. The clever teacher falls back upon the child's love of play or story and persuades it into learning by indirect means. But the interest thus aroused is

artificial in that it has no direct connection with the subject matter of the lesson, and much time is wasted because the child's attention is but half secured and he learns slowly and with great expenditure of energy on the teacher's part. Later on when the child's command of words is greater and his control over his muscles has increased he will learn to read and write with genuine interest in half the time, and without the strained admixture of irrelevant story.

Effective freedom means that the child's procedure is self-directed within the limits of the material available, and much of the teacher's skill is directed to providing material that may be suitable to her ultimate purpose as well as to the child's immediate ends. The Montessori system of education provides a clear example of what is meant by this, whether or no we entirely agree with the choice of material advocated. In a Montessori school the child chooses its own material from the toys and occupations provided and works and plays at its own pace, alone or with a group of other children, according to its inclination; it also changes its occupation at will. There is thus little or no class teaching, though for certain games and in most English schools of this type, for stories, the children may all come together. Clearly a school of this sort is only possible if the occupations provided appeal to the children's instinctive tendencies, that is, if they find them attractive and absorbing. The teacher, on the other hand, may see in them the means to an end and may note the child's progress towards the skills of reading and writing,

or towards an understanding of number. It is indeed only by remembering the nature of instincts that we can explain what is at first sight an amazing result—that of a large number of children working more or less independently without interfering with one another, and with no compulsion except that exerted by the general atmosphere of the school, the sight of the material and the pleasure of occasional help and encouragement from the teacher or their companions. The contrast between this and a school managed on the old lines, with its half-attentive children doing careless work and on the look out for every form of surreptitious amusement, needs no comment.

It is not necessary here to give any list of the chief human instincts, and indeed different writers have adopted different methods of classification. Thorndike, for example, enumerates about fifty instincts, some of which, such as sucking, other writers have called reflexes. Others in the list, such as specific fears, of noises, of open places, of the dark, and so on, can conveniently be grouped together under the one heading 'fear.' In McDougall's classification, where special importance is attached to the emotional side of instinct, the list is much shorter, because in several cases impulses apparently innate have no specific emotion which can be distinguished as characteristic of them. Thus McDougall classes sympathy, imitation, and suggestion as general innate tendencies because the accompanying emotion in each case is vague and indeterminate. Again, some of the instincts in Thorndike's list, such as those of creeping, standing, walking, ripen and

either disappear or develop into habits long before the child can describe the accompanying emotion, although this may very likely be of a specific and distinguishing nature. Both wider and narrower classifications may be of use to the teacher: the former when he wants to study the various forms of activity he may expect to find in young children and to distinguish those generally believed to be innate from those due to environment: the narrower, as giving a list of the known strong emotional impulses connected with certain stimuli and likely to call out certain reactions. The narrower list, if we include the so-called innate tendencies, contains most of the impulses upon which the teacher must rely in school life and for which he can provide appropriate stimuli: many of the others are apparently dependent upon physiological conditions and stimuli which are not directly within the teacher's control. Thus it is easy to stimulate a child's curiosity, anger or fear, but difficult to stimulate him to creep. He will try to creep of his own accord as soon as he feels able to do so. Hence the narrower and more definite treatment of instinct is of the greater direct importance to the teacher, and it is on this account that we have adopted it for the purposes of this book.

The tendency to play demands special consideration because of its primary importance in child life and its widespread uses in education. It is sometimes called an instinct, but if we adopt the criteria suggested above we cannot give it this title because there is no specific stimulus which arouses it, nor, apparently, any one specific

emotion felt while the individual is playing. In fact the simplest view of play is that it describes the attitude of the young child towards life. It is hardly too much to say that the distinction between work and play is an adult distinction and has little meaning for the child, or for those who are observing him. If we adopt this standpoint, however, we must not of course limit 'play' to what is easy. As far as effort goes, few adults work harder than a healthy child of eighteen months or two years old, and in a suitable environment this whole-hearted energy of body and mind, entering vigorously into whatever is on hand, should be kept up to some extent into late childhood and even into adult life. We say 'to some extent' because with developing interests distractions arise and the interests themselves imply greater strain as the child's purpose becomes more definite and less immediate. But granting this limitation, the play attitude is the right one for the child and the only one natural for him. If however by 'play' we mean mere 'fooling'—good in its way but without a definite end in view—then the child, even from babyhood, both works and plays. He works at talking with an almost painful effort to express himself and be understood; he works, for example, at taking books out of a shelf and piling them up on a chair, or at filling his bucket with pebbles. He also 'fools,' throwing things about aimlessly with delighted laughter, pulling someone's hair, rolling on the floor, and so on. In the former cases interruption or misunderstanding is serious and generally results in a storm, in the latter one form of 'fooling' passes readily

into another or into one of the forms of 'work.' 'Fooling' is often valuable physically and, except for some specially excitable children, appears to afford more mental rest than a healthy child can get otherwise than in sleep, but it is not of much direct value to the teacher in school, and it seems a misuse of language to restrict the term 'play' to it to the exclusion of the other more purposive attitude.

Finally, it may be pointed out that when instinct is recognised as the basis of school training it is well to remember that individuals differ both in rapidity of development and in natural endowment. All children do not appear to experience instinctive emotions with equal force, and, moreover, instincts appear to ripen at slightly different times in different cases. Hence classification according to age is misleading, as indeed is well known. It is more important to note that greater freedom of choice of occupation and less rigid insistence on class teaching will materially simplify the problem of classification. The child can satisfy his instincts with the material best suited to him without retarding or accelerating the pace of his fellows, and the result is to remove a serious cause of strain and friction.

It remains to consider how the conception of discipline has been altered by the stress laid on freedom and instinctive development. Teachers have long been familiar with Herbart's distinction between government and guidance; they have long agreed that 'guidance' is the final goal. The change in modern times seems to be that the period for guidance has been put earlier, in fact,

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apart from considerations of physical welfare which act as an important check, some theorists would say, the earlier the better. But this does not mean disorder and anarchy, it only means that the instinctively occupied child is intent on his own business and is neither 'naughty' nor inclined to interfere with his neighbours for the mere sake of interference.

Still the teacher's government has its place. On the one hand the child's own pursuits may in themselves prove disturbing to his companions, and here some readjustment is needed. Moreover, times and seasons need to be observed in most communities and certainly in most schools, and the child, like the genius, resents, reasonably enough, interruptions. A baby is apt to be righteously indignant at being stopped in his play to have his dinner, and is perhaps still more angry at having his hands washed, although both these functions are enjoyable in themselves. And the same thing occurs with older children, though in school this is lessened by the tendency to imitate and accept suggestions from the movements of the rest of the class. Still every teacher will find occasional need to enforce a certain sequence of events.

In practically all schools too teachers will have a certain proportion of children who have been ill-managed at home or elsewhere and who have thus already acquired a wrong attribute towards their fellows. Such children may have been treated too severely, until they suspect all authority of being harsh and unreasonable, while at the same time they have grown so accustomed to punish-

ment that it has little restraining effect upon them. Others may have been spoiled, in that their selfish impulses have been pampered at the expense of their unselfish ones and they have grown capricious and lazy from overmuch attention and well-meant attempts to satisfy every wish. Others may have experienced a mixture of both treatments. In cases like these the children will need time to adapt themselves to their new environment, and in the interval some friction is hard to avoid.

‘Government,’ then, will still be necessary in some degree, and probably punishment too must be admitted, although we may readily acknowledge that recourse to punishment is an admission of failure on the teacher’s part as well as on the child’s. Moreover, the word punishment is to be understood in a wide sense as meaning any method of making the consequences of his actions unpleasant to the child. Some schools claim to have ‘no’ punishments, but if the claim be examined it will generally be found that what has really been done is to produce such an atmosphere that a word or two of blame, or the disapproval of the other children, is effective to restrain the pupils as much as is desired. In brief, punishment has been made more civilised, though, be it noted, not necessarily less severe, but has not been altogether abolished. Punishment in this wider sense of the term is indeed an effective deterrent throughout life, and most of us can remember occasions when the surprise or disapproval of friends proved a sufficiently severe penalty.

Punishments, then, will be occasionally necessary, but we may rule out at once any that are either injurious to

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health or tend to make a burden of things that we wish the child to enjoy or are merely silly. With this proviso the only sane method of estimating the value of a punishment seems to be by its results as a deterrent. Both teacher and child should understand that the punishment is intended to remind or to deter, and if it fails to work something else must be tried. This should be obvious. Yet we still find schools where children are 'kept in' week after week, in some cases almost day after day, for some particular fault. Yet clearly if being kept in does not have the desired effect at first the child becomes used to it. Being punished may grow into a habit as readily as anything else. As a rule if a fault recurs again and again in spite of punishment it is a sign that some readjustment is needed. Something is being demanded of the child to which at present he cannot respond, and the teacher who, through a mistaken sense of dignity or an excessive respect for rules, continues to insist, is at best putting himself into an absurd position, and at worst doing the child serious harm. Such teachers have the *naïveté* of certain magistrates who never tire of expressing their surprise at the number of convictions recorded against some of the prisoners who come before them, not realising that if the first term in gaol does not act as a deterrent the succeeding terms are proportionately less and less likely to do so.

Finally even in regard to punishment self-government should be kept in mind. Whatever point of behaviour the teacher insists on should be clearly understood and if possible approved by the child—not a very difficult

matter since most children are extraordinarily open to reason and eager to please. Then the punishment should be regarded not as retributive, still less as vindictive, but as a reminder. The child's attitude towards punishment might well be that of the small boy who having been sent into the corner two or three times for putting jam on the visitor's dress, came back finally remarking as he climbed into his chair, "I think that's done it," and behaved properly for the rest of the meal. It has even been found effective to let children choose their own punishment out of perhaps two or three specified. This removes any resentment and gives them a personal interest in the result to be attained which is likely to make that particular punishment effective as a reminder.

It will be easily realised that punishment is hardly if ever applicable or likely to be effective in the case of so-called moral faults—lying, cruelty, and so on, though it may lead the child to conceal them. Faults of this sort need to be remedied by arousing other impulses and giving special stimulus to instinctive tendencies opposed to these particular failings. Even the social punishment of blame and disapproval needs to be cautiously used, and here as elsewhere in life praise of the good is infinitely more effective than condemnation of the bad. Indeed the study of instinctive development leads us always to positive rather than negative discipline wherever it is possible. Stimulate the child to do differently in the future rather than punish him for what he has done badly in the past.

CHAPTER II

THE MODIFICATION OF INSTINCT: PURPOSIVE ACTION

INSTINCTIVE action is unlearnt. It takes place in consequence of the inherited nature of the organism and will take place apart from any training. But this must not be taken to mean that the process is absolutely fixed and unchangeable. Fixity and definiteness used to be regarded as a distinguishing feature of instinctive action, and this was perhaps one reason why man's dependence on instinct was minimised. Variability was thought to imply reason. But it is now generally recognised that even in insects and animals the fixity of the instinctive reaction has frequently been exaggerated. On the one hand individual variations are frequent, and on the other the animal can 'learn by experience.' This learning by experience may result either in some modification of the reaction, or in the instinct being excited by stimuli which vary in some degree from those primarily appropriate to it. Of the three factors in the instinctive process, the stimulus, the emotion and the reaction, the first and last are thus found to be subject to modification by experience and by deliberate training—on the other

hand, the emotional factor is held to be little susceptible of modification in the history of the individual, and has probably been the most constant of the three in the history of the race. Thus an angry modern Englishman probably feels very much as angry primitive man felt, but different things may arouse his anger and his reactions may be different.

We need not therefore expect to find definite and invariable instinctive reactions in children, though we may expect resemblance to a common type. Thus of a family of children all crawl before walking, but one crawls on hands and knees, one pushes itself along in a half-sitting position with a hand free to clasp a toy, and a third trots on all fours. Similar differences in the various instinctive reactions will be found throughout, and examples can easily be multiplied by any observer of children. More important, however, to the teacher is the fact that instinctive reactions are modifiable by experience and that 'experience' includes the various forms of direct and indirect training. In practice, of course, it is often difficult to tell whether varying reactions are due to some innate differences in the children observed or are the effects of environment, including perhaps some form of training. Thus in the example given above the different methods of crawling may have been, and very probably were, due to some physiological distinction; but at least in the case of the child who crawled so as to hold a toy the position may have resulted from some special attachment to a particular toy at the time when he began to crawl. In the activities of rather older

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children, too, it is often impossible to say whether some particularly characteristic 'reaction'—special interest in some particular subject, for example—is due to a special appeal made by his environment or to some innate tendency or gift. Hence it is rash to expect that an environment which we have found successful in arousing certain interests or producing certain behaviour in one child will prove equally successful in another, though we may hope that it will do so. With this warning we may pass on to discuss the importance to the teacher of the question of the modification of instinctive reactions and of the stimuli which produce them.

As has been pointed out, it is often difficult to decide what determines the form of the first reaction or the first few reactions, but it is clear that after these first few reactions the particular way of carrying out the instinctive act becomes habitual and is likely to persist on subsequent occasions whenever, or as long as, that particular activity is practised. A child does not, as a rule, unlearn his method of crawling after he has once acquired it, and, though he may vary it occasionally, he generally lapses into the favourite form when he is in a hurry. And when we consider the more complex instinctive reactions we find the same thing occurring. Here too an habitual form of reaction soon appears and becomes relatively persistent. Every child has certain definite ways of showing anger, affection, curiosity, and so on, and these ways become habitual by constant use and often persist into adult life. An interesting example of the use to which this fact may be put in education is

found in some of Dr. Montessori's apparatus, devised to give children opportunities in school of practising certain enjoyable movements such as that of climbing along a gate, which are calculated to give them better habits of balance and control and ultimately better habits of walking, running, and so on.

But the teacher can also modify reactions by a more direct method. It is obvious that in any creature capable of profiting by experience any reaction which fails to satisfy the instinct in question will tend to be avoided in the future, whereas any successful reaction will tend to be repeated next time. This is the basis on which rests the most effective ways of 'training' animals to modify their behaviour in a desired direction, and it has been used from time immemorial in training children. In this way the curious child learns not to snatch at the object which stimulates his curiosity but to ask for it, and later to ask questions about it, possibly without even attempting to handle it. Similarly, children learn to inhibit the more violent expressions of anger, such as kicking and screaming, and though they still feel and show anger, they choose less noticeable forms of relieving their feelings. Again, in some families demonstrative expressions of affection are encouraged and these become habitual to the child, in others the forms of expression favoured are quieter and the child adapts himself accordingly. Much of the child's training in good manners consists in thus favouring or making successful certain methods of satisfying instinctive impulses to the exclusion of other methods. But people are apt to expect

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too much from the system and to hope that by making *all* reactions to certain instincts sufficiently unpleasant they will prevent the excitation of the emotion altogether. They hope by ridicule or other deterrents to make a timid child fearless, or by snubbing questions to cure another of inconvenient curiosity. Such treatment, in fact, is apt to make the timid child more nervous than before and to incite the curious child to the discovery of less legitimate ways of satisfying its curiosity. Once stimulated, the instinctive process is like a stream which it is difficult to dam up or choke off, whilst to turn it aside and modify its course may be comparatively easy.

Just as we find children differing in their reactions to instinctive emotions, so also we shall find different stimuli arousing their instincts, and these stimuli will vary according to the child's past history. Take, for example, the instinct of fear. Children learn by experience that certain objects of which they were at first frightened, owing to the noise they made, their sudden movements and what not, are in fact harmless, just as cattle grazing in a field near a railway soon grow indifferent to passing trains. Children also learn that other objects not in themselves terrifying are in fact dangerous. Thus they learn not to touch fire, not to walk on a railway line, or to be afraid of snakes. In all these cases the modified effect of the stimulus may be either the result of direct experience, when the child learns as an animal might do, or the result of increasing knowledge often gained by the explanations and warnings of their elders. Moreover, by association they

acquire fear of objects which resemble something that has frightened them or which in some way remind them of it. Thus a child who has been bitten by a dog is afraid of all dogs afterwards, however harmless they may be, and a child who has been terrified by a cow on a certain road will try to avoid that road on his daily walks, although he may know that the cow is no longer there. As children grow older, however, knowledge and reason both help increasingly to modify the stimuli which tend to excite their fears. They know how to distinguish the ill-tempered dog or cow from others, and act accordingly, and they reason about their fears of fire or of the dark. Most people, indeed, can reduce such terrors to fairly sane proportions in later life even when they suffered from them excessively in childhood.

Further examples of the modification of stimulus and reaction may be found in the case of other instincts. We will consider briefly two: curiosity and constructiveness.

Curiosity is stimulated by what is novel and inexplicable. At first the child's curiosity is aroused by every fresh object, or rather by any change in his environment that he is able to perceive. A baby may be said to be curious about everything that he attends to. Light, moving objects, brightly coloured objects are all noticed early, then gradually, as he becomes more familiar with his surroundings, he begins to take many of them for granted and only shows interest and curiosity in them when they are altered in appearance or position. But he is still curious about new objects when these come

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within his powers of perception. He shows his interest by certain well-known reactions which consist in following the object with his eyes, expressing surprise by some exclamation and, when he is able to speak, by words, grasping or attempting to grasp it, and if he succeeds in getting hold of it by handling it in all sorts of ways, and, unless prevented, by biting and sucking it. Later on he will also ask questions about it, but this does not as a rule replace his desire to touch and handle. This process of examination will be continued until his curiosity is temporarily satisfied. He may wish to re-examine the same object next day, but his curiosity will be less this time, and unless the handling process is pleasurable and leads to some form of play he will soon lose interest in that particular thing. Naturally as his powers of perception increase a wider circle of things will arouse his curiosity, but the sequence of keen interest, examination in any way possible, and loss of interest when curiosity is temporarily satisfied, will repeat themselves. At the age of eighteen months or two years an intelligent child shows curiosity about a great variety of objects: cows feeding in a field or walking down the road, pieces of paper dropped by the roadside, a man cleaning windows, tiny kittens, boats being unloaded, and so on. But gradually, alongside of this general curiosity, the growth of a more specialised curiosity can be traced. This develops along the lines of activities that have proved pleasurable and hence tend to be repeated. Increased familiarity with the objects now makes him able to perceive much smaller differences, and hence his

curiosity is readily excited by a comparatively small novelty in these special directions. One familiar form of such specialised curiosity is that aroused in many children by railways, another is connected with animals, another with houses. Even children of four or five will be found to have special interests and a marked tendency to curiosity in some one or more of these or other similar directions. The starting-point of such an interest is often difficult to trace, but once given the direction, interest, curiosity, and knowledge will rapidly increase unless the environment is very unfavourable. As a rule, any such interest is apt to be encouraged by presents of suitable toys, by what the child is taken to see, by the tales told him, and so on.

By the time the child is eight or nine then, we find him not only still curious about things in general that strike him as novel, but more particularly curious in certain directions, and in these directions we often find him possessing a surprising amount of knowledge and a surprising power of noticing fresh developments and of showing intelligent curiosity about them. In other directions perhaps he will seem equally surprisingly dull and incurious. At the same time we find that the means taken to satisfy his curiosity will have developed and altered. He will no longer bite or suck, but he may question his elders, seek information from books, or perhaps experiment and investigate on his own account.

A somewhat similar process of development may be traced in connection with the child's constructive instinct. This instinct shows itself at first in a tendency to

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dabble in water and mess about with sand or mud or any convenient material, and probably also in that arrangement and rearrangement, piling up and packing away of toys, bricks, books, shells, or anything else available which is such a favourite occupation with many young children. Suggestion from others generally plays a large part in starting the child's activities in more definite directions. Thus by tradition the baby generally begins his building efforts by making 'towers' to knock down, just as when he is older he will build 'castles' on the sands. In time he builds houses and railways, led by imitation and suggestion in the first instance, but adding and working out novelties for himself. When once he has enjoyed a bit of constructive play he tends to repeat it at the next opportunity, and thus he generally forms a habit of building some particular object when left to himself. Naturally such a habit is often connected with those special interests whose development we have already considered in connection with the instinct of curiosity. The same thing is seen in children's 'free' drawings. They develop habits of drawing houses or people or trees, and carry on this particular activity for long periods, sometimes for months. This, of course, only applies to drawings done spontaneously and not to those done for a special purpose, though even in illustrating stories some children will introduce a favourite object into practically every illustration they draw, whatever the story may be. In such cases the instinctive impulse has found satisfaction in the use of certain materials in a certain way, and the activity in this form has become

relatively habitual. We say 'relatively' since obviously and indeed fortunately such habits are easily disturbed by fresh stimulus from playmates or elders or by the varying demands of school life. But in the main, just as the child tends to develop specialised interests with their accompanying specialised curiosity, so he tends to acquire habits of occupying himself with certain forms of constructive work. So, too, if these forms are too 'childish' and incapable of development his constructive instinct may apparently wear itself out on them until interest in construction lapses altogether, possibly never to revive.

We can now consider more particularly the educative bearing of these modifications in instinct. It will be convenient to discuss this from two points of view, first in reference to the growth of purposive or voluntary action, second in reference to the development of mental activities and thought. The latter discussion will be deferred to the following chapter. This division is adopted because we are accustomed to distinguish between the teacher's function of aiding the child to form definite aims and of guiding the selection of these aims, from his function in helping the child to attain these aims whether by offering information or by encouraging thought or by inducing perseverance. It must be noted, however, that purpose and thought necessarily develop together. The child cannot advance far in ability to seek an end without increased mental power to realise it and to work out the means to attain it. And on the other hand, his mental growth is closely connected with his efforts to attain his purpose.

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Now all instinctive action is purposive in the sense that it satisfies the child's emotional needs and is what he desires to do at the moment. But as we have seen, the reaction follows so quickly and, as it were, inevitably, on the stimulus that the child is sometimes hardly conscious of having acted until afterwards, and he has at first usually no consciousness of an aim. It is better therefore to reserve the term purposive for actions in which there is a definite end in view. This end may either coincide with the activity itself or the activity may be regarded as a means to the end. We may begin by giving an example of the development of purpose observed in a child of eighteen months. The child could walk holding on to something but not alone; while playing about he happened to pull himself up with the help of a light chair which of course slid away as he touched it. He followed it holding on all the time, and in this way pushed it across the room. So far the reaction was merely a response to instinctive activity and play tendencies, but at this point purpose began to show itself. At the end of the room the chair stuck and he showed his desire to push it back again by crawling across the room to fetch someone to help. It was turned round and he started again. This process was repeated for ten or fifteen minutes. The following evening the sight of the chair at once aroused the desire to push it, and he asked to have it brought out. This went on for several evenings until he wearied of the game. This activity, although so simple, shows the characteristics of purposive action: (1) the idea of some definite end, i.e. to

push the chair across the room ; (2) the thought about and adoption of means to attain the end in the face of obstacles, i.e. by fetching help to move the chair out of the corner. All cases of early purposive action are very similar. The instinctive activities lead accidentally to some specially pleasurable activity. The pleasure taken in the result makes that particular action clearer to the child's mind and he repeats it. Some difficulty arises, and in order to overcome this he has to seek some means to attain his end. Of course the difficulties are at times too great, and then according to his temperament and the strength of his purpose the child either cries or turns to some easier game.

As the child gets older his powers of forming an idea of his aim increases and he is also better able to think out suitable means, but the process is essentially the same in that his instincts and his developing interests lead him to some activity the idea of which is made clearer to his mind by its pleasurable nature, and often still clearer by the difficulties which have to be overcome in its pursuit. The following example may serve to illustrate this later stage. A boy had developed a great interest in building houses with sand and bricks and in examining the arrangement of rooms in real houses for purposes of comparison and imitation. He was fond of drawing and used to plan out imaginary houses on paper as well as in the sand, and make up stories about them. Later on he, as children often do, developed this game into a more elaborate one involving imaginary countries with towns, villages, and so on. When he was about seven

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years old this imaginative game occupied a large share of his thoughts, and as he had several times seen maps and had easy access to them, he naturally turned from making plans of houses to drawing maps of his imaginary countries. In making these maps he wished to show the position of physical features and towns, but more particularly of mines, railways, and so on. Hence by means of questions and by a further study of atlases he learnt how to indicate mountains, rivers, railways, coal mines, and even rainfall in his maps, and also to understand something of the meaning of scale and the uses of lines of latitude and longitude. In this case the purpose was strong enough and definite enough to lead him through a number of varied activities and investigations and to enable him to master a number of details some of which were by no means easy for a child of his age. Incidentally he developed a genuine interest in geography and acquired some general geographical knowledge in addition to that connected with his special purpose of map making. It should be noted that no particular encouragement was given him by his elders beyond a readiness to answer questions.

Purposive action in quite young children is necessarily connected with their instinctive impulses, but as these impulses develop into more or less habitual activities and the child acquires definite interests in connection with these, his aims will often be related to these interests. Consequently older children must be expected to show purpose in widely differing directions corresponding to the variety of their experience and developing tastes.

We may now briefly summarise the characteristics that the teacher may expect to find in such cases of purposive action. Some of these characteristics are, however, closely connected with mental growth and will have to be referred to again later on.

(1) The purpose is the child's own, and the idea of it has come to him in direct connection with his instinctive activities or with his dominant interests. Hence his desire to attain it will be proportionately strong and may have something of the strength of the original instinctive impulse. He will need no urging to carry it out, and indeed anger and resentment may be roused by any discouragement, and disappointment will be considerable if material obstacles should prove insurmountable.

(2) Since the idea of the end generally comes to the child in connection with his habitual activities, he is likely to have a stock of ideas on the subject which will enable him to understand new points and to overcome difficulties with apparent ease. This quickness will often surprise us if we do not know the child's past history and merely compare him with other children of like age and ability but different experience. Moreover, quick progress in achieving a purpose that is the child's own in this way has often to be contrasted with the slowness and apparent stupidity with which the same child works towards an end suggested to him by others. He may be eager to attain the suggested end, but the stock of ideas connected with his previous activities is here absent and this explains the difference in result.

(3) The knowledge gained in pursuit of the end is

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likely to be retained owing to the zest with which it is acquired and its connection with existing interesting ideas. Such past knowledge often forms a starting-point for fresh interests and new lines of thought when the immediate purpose is satisfied. Thus the geographical interest in the case of the boy mentioned above may probably persist long after his pleasure in imaginary countries has died away .

(4) The ends that children set before themselves, though they are sometimes attained with surprising ease for the reasons given above, yet on other occasions give ample opportunity for hard work and the conquest of difficulties. The struggles which children sometimes make to succeed in their self-imposed tasks in the face of numerous obstacles are a partial answer to those who complain that modern education makes everything ' easy ' for the child.

We may conclude this chapter by noting the teacher's special responsibilities in regard to this development of purpose in children. Here one of his most important duties is to see that the child's aims are not all selfish. The self-regarding and individualistic instincts are naturally very strong since they are closely connected with the preservation and growth of every young creature. But the child has also other instincts belonging to him as a ' social ' animal. Of these love and affection, the susceptibility to praise and blame which arise out of the instincts of self-assertion and self-abasement, and the protective instinct are the most important. All these instincts can be most effectively aroused in con-

nection with habitual activities and interests. The child's purpose may thus be unselfish while yet he is working at pursuits of which he is already fond. Gradually he may pass from this to unselfish activities which are less attractive in themselves. Love and affection, for example, should be given plenty of scope in the performance of acts of kindness and consideration which are in themselves pleasurable to normal, healthy children. In this way the aim of being useful and kind becomes a more permanent one, and as the child grows older he is better able to respond to more serious demands on his unselfishness. The protective, or as it is sometimes called the parental, instinct is perhaps even more valuable as an incentive and is sometimes particularly strong in healthy, vigorous children whose other impulses seem predominantly individualistic. The term 'parental' is somewhat misleading because it is apparently apt to suggest 'maternal' and to convey the idea that this particular instinct is generally peculiar to girls, whereas the protective instinct to take care of and look after something weaker than oneself appears to be equally strong in both sexes.

In a normal home all these instincts are naturally and continually appealed to, indeed home life is sometimes criticised as tending to undue limitation of the child's individualistic impulses after he has passed the stage of babyhood. In school the position is apt to be reversed. Most schools are organised on individualistic lines, and even where modern notions of greater freedom and more scope for the child's instinctive activities are accepted

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they have often been grafted on to the older organisation. Hence appeal is only made to those instincts which can be satisfied without too great a revolution in the previous state of affairs. But co-operative work, kindly help and interest for others, possibilities of doing acts of service for the general good and so on are too novel to be readily provided for, so that it is only in a few schools, and these generally for quite young children, that we find anything like the appeal of a good home made to the child's social as distinct from his individualistic instincts. It is little wonder that critics complain that freedom in school makes children selfish, since the appeal is so often only to one half of their nature. And in the primary schools at least the still prevalent lack of co-operation between parent and teacher cuts the child off from many important outlets for and stimuli to his social impulses. To give only one instance out of many. The child taught at home finds great pleasure in drawing 'pictures' and later in making presents for his parents and brothers and sisters, and the construction of such presents adds considerably to his interest and pleasure in handwork. In schools his drawing and constructive impulses are still sometimes only directed to producing a bit of work good enough to be shown to the rest of the class or to be displayed on the wall or shelf.

In the second place the teacher must recognise that children differ widely in their powers of initiative and in their ability to form definite aims just as the nature of these aims themselves will differ. Some are inventive

and full of spontaneity and freshness, others are slower to invent but perhaps more painstaking in the performance ; these latter have something of the craftsman in them and take pride in good workmanship. Some want to work at a thing until it is finished ; others are eager in thinking out their plan and selecting material, but their purpose weakens when these initial problems are settled. In each case sympathy and help are needed where the purpose is weakest. The inventive child needs encouragement to aim at finishing his work in order to test the plan he has invented ; the craftsman child needs help in formulating an aim at the outset ; and the child of variable moods needs persuasion to persevere now and again, and above all needs safeguarding from interruption and discouragement on the rare occasions when some pursuit has taken more permanent hold on him.

CHAPTER III

THE MODIFICATION OF INSTINCT: MENTAL GROWTH

IN the last chapter we tried to show the connection between the child's early instinctive impulses and his later purposive and voluntary actions. It now remains to consider more particularly the child's mental growth. It has already been pointed out that the two are in fact inseparable, when the child acts he also thinks and feels, and throughout his mental life these three factors: activity, thought, and feeling, are inseparably connected and are perpetually reacting upon one another.

In the early stages of a child's life the things perceived and attended to are those which excite his instinctive impulses. The effect of the resulting activity is necessarily to make his perceptions clearer and more definite. His attention involves the use of all available senses in the further investigation of the object, and by handling and playing with it he learns to distinguish it more clearly from the surrounding objects and grows familiar with its properties. It will be found that the baby of a year old soon tires of handling the object, say, a doll, unless it offers fresh possibilities by being capable of

gradual destruction, or unless he acquires the habit, as some children will, of carrying it about. His perception of it is clear up to the point he is capable of reaching and his curiosity is temporarily satisfied. But a few months later it is offered to him again, and now his knowledge of the human body has increased by attention to his own features and those of other people. He is now able to notice that the doll has eyes and mouth and legs, and he finds fresh scope for activity and interest in pointing out and naming these over and over again ; for the process of connecting percept with name affords intense delight to most young children. At this stage too, or a little later, he will begin to use the doll in definite play, give it milk to drink, hold a cake to its mouth, and so on. He has the idea of himself drinking milk and makes this more definite and general by using it in his games with the doll. Here again repetition will follow until the process is too familiar to interest him. Then it may either be dropped or more probably will develop into a more elaborate game of the same kind. In all this curiosity plays a large part, aided later by imitation. The game may be wholly spontaneous, except perhaps for the first suggestion that the doll should be given its ' tea.' In the process the child gains, as we have said, clearer perceptions and a more readily available stock of ideas with regard to the daily activities which he repeats in his play. Meanwhile his activities have been going on in countless other directions. He sees flowers picked and asks for them and handles them, sees them put in water and afterwards repeats this for himself. One baby not

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quite two years old was observed picking daisies and putting them carefully into an empty can which he connected with water from having seen it used to water the plants. Another time he sees the cut flowers, daisies, made up into a chain and he thus gets an idea of divergent possibilities in respect to them. Throughout his thought activities are connected with his instincts and with the interests arising out of them.

Now from the nature of things these activities must be selective, just as all attention is selective. Hence all activity and the corresponding clearness of perception and increased stock of ideas implies a corresponding neglect of other activities and a corresponding absence of clear percepts and ideas in other directions. The young child's activities are so catholic that his interests appear to embrace the whole of his environment. But careful observation discovers the beginnings of the selective process. Some games are repeated day after day with or without assistance from his elders, others are apparently enjoyed once but the child never returns to them. As he grows older the selective process is more clearly marked, and as we have pointed out, helps to determine the modifications in the instinct of curiosity. This specialisation of interest always means specialisation of knowledge. The child's percepts and ideas will be clearest along the lines of his more permanent interests owing to the manner in which these are built up, and he will be able to think and talk more readily about things connected with these interests. Hence he is in a position to learn more, to see more, and to understand more along these

lines, whilst in other directions he has only vague notions based on statements half understood and things inadequately observed. "He that hath, to him shall be given" is certainly true of knowledge in any given direction.

This view of mental growth marks an important distinction between modern theory and the view of earlier educationalists. We cannot now regard the child's mind as made up of various faculties, 'observation,' imagination, memory, and so on, and trace his progress in these quite apart from the material on which he has exercised them. If a child is said to be 'observant' we must know in what directions he has practised and developed his powers of observation, and in what other directions his interests have been weak. Then we may reasonably expect to find him observant where he has been interested and has acquired knowledge, and may equally reasonably fear to find him 'unobservant' in other respects. The street boy is observant in his own sphere but he will prove a poor guide in a country lane and may be a dull boy in school. Thus the modern theory disposes of the convenient educational notion of 'formal' training, according to which the subjects to be taught in school might be selected each for their supposed value in training some faculty. Thus by teaching arithmetic to ensure accuracy, needlework for neatness, nature study for observation, literature for imagination, and so on, we might hope to turn out a child who was in general and for all purposes accurate, neat, observant, and imaginative. In actual fact we find the process of mental growth

to be specific in each case, and indeed to some extent special training in one subject may tend to prevent the exercise in other directions of the particular faculty we believed ourselves to be cultivating. The more absorbing the interest and the more effective therefore in stimulating the activities of the child or adult, the less time and energy will there be for other interests and the more closely will habits of thought and procedure be connected with the favourite pursuit.

The cruder forms of this theory of formal training have long been abandoned, but it is unfortunate that its terminology still survives in some even recent books on education. Meanwhile the question of whether any transference of mental power acquired in one direction to other allied subjects is possible, and if so under what conditions and to what extent, is still a point of dispute among experimentalists. Here we need only remark that such transfer where it exists at all appears to be due to the cultivation of an intelligent attitude of mind which enables us to attack fresh matters more effectively. It is the 'concept of method' which is transferred, not any specific improvement in 'faculty.'

The practical results of all this for the teacher would seem to be somewhat as follows :

1. He must aim at providing stimulus and opportunity for the exercise of a number of instinctive activities and for the development of wide interests. Luckily the inter-connections of human knowledge are so numerous that the child readily passes from one already developed interest to another. We have pointed out the

danger of neglecting to stimulate aims and activities connected with the social instincts, and these activities will assure the growth of social ideas and prepare the way to intelligent citizenship. But there is a further risk of being content with narrow opportunities and interests because the child is 'happy' in the interests he already has. This is generally a greater danger in home education than at school, where a fairly wide curriculum is usually planned out and where 'narrowness' is looked upon with suspicion. Many adults, however, find themselves regretting that incipient tastes for, say, music or constructive work were neglected when they were children until the desire for such pursuits died away.

Instinctive impulses are strong while they last, but many of them appear to be transitory. Thus adults and even children often lose all interest in constructive work owing to lack of opportunity and encouragement, and the keen curiosity of the normal child lapses into middle-aged apathy, or, even worse, into incessant 'gossip,' if it is not provided with proper stimulus.

2. It is important to see that the child's interests and activities work progressively, and that he does not merely satisfy his instincts by a repetition which fails to produce effective mental growth. Children left to themselves sometimes prove inventive and progressive, but they may also stagnate for want of fresh ideas and repeat the same game or make the same pictures without getting any further. This danger has been pointed out by Dewey, and it is perhaps not one which teachers are, as a rule, likely to overlook. But they may blame the system of

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freedom in education for the stagnation because they confuse freedom in working out activities with freedom from fresh stimulus. On the other hand, it would be rash to assert that the child gets no benefit from this seemingly monotonous repetition of an activity, provided that it is genuinely interested. But children may fall into the habit of occupying themselves without using their full powers, and it is for the teacher to provide at least the stimulus to progress further. Suggestion, fresh material, observation of other children all serve a useful purpose in such cases. Moreover the teacher is responsible for providing material likely to lead the child in directions that are permanently useful. He may legitimately have in view at any given stage the child's later school life, just as the school as a whole must keep in view adult life after school. It is only in this way that he can help the child to secure those stocks of ideas and memories which will help to easy and rapid progress. Moreover, if he fail in this he will find the child lacking in that spontaneity of purpose which is most effective as a driving force. Much is often done at the Kindergarten stage to encourage children to develop interests which will help them in such subjects as history, geography, and science, but the value of this is apt to be lost by formality and lack of spontaneity in later school methods. Thus the older child finds his former activities repressed or guided in directions which he only half understands and he rapidly becomes 'bored' with school work.

3. But perhaps the teacher's most difficult task is that

of helping the child to overcome the difficulties which he meets with in carrying out his aims. It has already been pointed out that spontaneous purpose provides the best incentive to this, but the teacher's aid is constantly needed. Indeed it is only by realising and acting on this that he can finally meet the contention that spontaneity and freedom in education leads to selfishness and softness and makes a capricious and backboneless adult.

We have already remarked that critics neglect the influence of the social instincts in humanising a child's aims and helping him to unselfishness. We may here add that they neglect the effects of habit and of the growth of the relatively permanent and dominant interests in overcoming intellectual and practical difficulties. Moreover the instinct of self-respect makes children desirous of doing good work and willing to take pains to attain a higher standard if only it is set before them at a propitious moment. Every child should at times do what is temporarily distasteful to him but he should do it if possible at the bidding of some instinctive impulse or of some permanent interest which is strong enough to make him want to persevere. The end which demands the drudgery should be something which the child has set before himself, not something forced upon him by others. Children, for instance, are apt to begin making Christmas presents and then to find the task of completing them somewhat irksome. At this stage they should make a decision either to give up the attempt altogether or to work hard, perhaps doing a certain amount each day, so as to finish

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the present in time. If they choose the latter alternative it remains for the teacher to give opportunities for the work and by encouragement and perhaps occasional help to see that the thing is done. Of course, too, it is important to see that the work is really within the child's powers without undue hardship, and the more impatient and capricious children need at times to be limited in their ambitions or they will become disgusted with all such work. The following examples may serve to illustrate what is meant.

A rather 'idle' child of seven who disliked the few attempts she had made at sewing, and indeed was seldom fond of any form of steady careful work, yet spent some time for several days in sewing two pieces of stuff together to make a doll's blanket. Nor did she complain, although, in order that the sewing might be fairly secure, a certain standard of workmanship was required of her, which involved unpicking and starting again several times. When asked about the work afterwards she remarked: "I did not like doing it, but I wanted so much to finish it." It must be noted that the blanket was begun at the child's own request and that she was not urged to finish it, but worked at it quite voluntarily and steadily, although she generally played over and seemed unable to attend to any bit of work enforced by others.

The same spontaneity of effort must be sought in intellectual work, and can only be secured by following the lines of instinct and the gradually developing interests and by making them supply the driving force to carry

the child through the bit of drudgery. A child of six could write in large characters sufficiently easily to take pleasure in writing letters. Presently his imitative tendency and positive self-feeling made him wish to direct his envelope himself. It was explained to him that to do this he must both write smaller and take pains to write clearly and without crossing out, and that therefore he must write the address first correctly on a paper and then copy it on to the envelope. He agreed, but the effort of careful writing and copying proved too much for him and he decided to give it up and have the envelope addressed for him. After an interval, during which he wrote several letters, he was asked whether he would like to direct an envelope again. He assented eagerly, and this time, although the same careful procedure was followed, succeeded in completing the address satisfactorily. The drudgery of writing a thing twice and with great care, which he would almost certainly have resented had it been imposed upon him arbitrarily, fitted in with his general interest, and he saw the reason and necessity for it.

In both the above cases it will be noticed that a certain standard of work was demanded, for which however a reason was given which the child could readily understand and appreciate. There is indeed no reason why children should acquire a habit of doing slipshod work and scrambling through their tasks in an "Oh, it will do" style, when better things are really within their powers. On the other hand, it is important not to discourage and disgust them by setting a standard

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beyond their reach, or one which they see no object in attaining.

4. It must be remembered that appeals to interest are always relative in value, not absolute. We attend spontaneously to whatever has the highest interest value out of the possibilities before us. And the result necessarily varies both with our environment and with our own mental and physical condition. A book which engrosses us when in good health seems hopelessly dull after an illness; and vice versa, the silly novel which amuses us during convalescence cannot hold our attention for five minutes when we are well. Moreover the environment may present many conflicting claims on our interest or only one that really appeals to us. The work which we enjoyed yesterday seems thoroughly distasteful to-day, when a friend urges us to go fishing with him. All this is plain enough to introspection, and it is evident that this variability of interest values is likely to be even greater in the case of children, since their dominant interests are less fixed and powerful and they have less experience in discounting the attractions of temporary excitements. It may be necessary therefore for the teacher to see that the relative value of the more permanently useful interests is high, i.e. that the child is not unduly distracted by conflicting claims on his attention and by perpetual excitement. To let children follow out spontaneous interests and instincts need not mean subjecting them to a continual stimulus of exciting distractions and watching them jump from one to another like a puppy in a strange garden. Such continual

excitement tends to prevent the formation of the more permanent interests and leaves the child no time to get a real hold of the new ideas which crowd in upon him. Observation of young children up to three or four years of age in a normal home environment suggests that the natural course of development is a period of excitement when new powers and new experiences seem to come upon the child with a rush, followed by a period of comparative calm, during which he repeats and perfects the activities just discovered and becomes familiar with the new experiences. Then there is a fresh burst of growth and keen interest, followed by another calm, and so on. Possibly some sequence of this sort is the healthy form of growth throughout childhood. If so the teacher's function must be to give scope and opportunities to the child during the period of rapid growth by helping with material, with sympathy and with information as needed, but to be prepared for the lapse into a calm and perhaps half-bored state afterwards. During this period the child gets practice in working at things after the first keenness has worn off, and meanwhile he also gets valuable mental rest. It may be expected too that the child will need more help and companionship during this period, but to attempt to stimulate him continually up to the level of the active period is to risk over-pressure.

5. It is useful to observe the child's behaviour when his interest is immediate, i.e. where his purpose is to obtain the pleasure arising out of the work for its own sake, and again when his interest is indirect and he does the work as a means to an end. The best results are

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probably secured where both forms of interest are present, then the end in view may serve to carry the child over the less directly pleasurable portions of the work. Of this we have already given examples. Children vary greatly however, both in their ability to work for an indirect end,—a matter which obviously depends partly on age,—and in their treatment of the means. In some cases eagerness to arrive at the desired result leads them to hurry over the intermediate stage and their work becomes slipshod and poor.

6. The rejection of the theory of formal training has a positive as well as a negative side. On the one hand it obliges the teacher to look with suspicion on the inclusion of any subject in the curriculum on the ground, or even partly on the ground, that it is 'good training.' Each subject must be justified on its intrinsic merits. On the other hand, the school should provide specific training in most modes of activity which it is thought essential for the child to practise in later life. As regards 'work,' this demand is fairly well met in many schools by supplying a wide general education, to be followed by specialisation in any particular direction selected. But it is usually acknowledged now that education should lead to intelligent use of leisure as well as to ability to work, and very few schools realise what is needed for this. Teachers still fail to recognise that the child requires actual practice in the spontaneous use of leisure. It is not enough to stimulate interest in various subjects—or even in various occupations—which are judged suitable for leisure employments or hobbies. Since these are done

under the direction of the teacher the child's attitude lacks spontaneity. He needs, in fact, actual practice in choosing occupations for his leisure time and employing himself on them. He needs practice in making his own plans and in learning what information and help he needs and where to go for them. Some homes provide such practice, but many have neither the space nor the necessary material, including probably tools or books; or the knowledge and skill to give help and encouragement may be lacking. Opportunities of the desired kind are, it is true, provided in various schools for young children, and in some respects they are afforded by the Universities; but between these stages there is a gap where little or nothing is attempted. Many boarding schools for boys and an increasing number for girls seem to think it essential to see that practically all spare time is 'occupied,' more or less compulsorily, by games or other pursuits. But the element of compulsion takes away much of the value of these pursuits for the specific purpose here considered, however pleasurably the majority of the boys may be occupied. Day schools are apt to neglect the problem of leisure altogether. Thus for those whose education does not extend to the University stage there is no practice, at any rate after early childhood, in the distribution of time between various leisure pursuits, still less is any help given in learning the relation of these to work. Hence some people never play at all, while others never work unless they are obliged. Moreover, even those who do 'play' fail to get the maximum of enjoyment and interest out

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of it because they have such a limited notion of its possibilities. And this not necessarily because they have not, while at school, been interested in and enjoyed doing a variety of things, but because these things have been marked off in their mind as 'work.' They never spontaneously occupied spare time with them at school and have had no practice in selecting an occupation to suit their health or mood, or in overcoming, by their own efforts, the initial difficulties of finding the materials, whether books, wood, tools, or paints needed for their purpose. In default of such specific practice few people have the initiative and energy to develop a 'hobby,' and those who do so are needlessly restricted in their choice by lack of knowledge or imagination. Every child should have practice in occupying himself pleasurably and intelligently, both in co-operation with others and by himself, and of occupying himself in ways that are neither harmful to himself nor objectionable to other people.

The practical question remains as to how all this spontaneity and freedom is to be attained in a community like the school, where there are many diversities of character and temperament and consequently many divergent aims and interests. The problem has already being partially solved, as we have said, in some of the best schools for young children. It is only beginning to be recognised as a problem in the later stages of school life. Possibly the solution here will be arrived at along somewhat similar lines. There will be a great reduction in the time given to class teaching in favour of individual

work or co-operative work in small groups, and there will be much greater freedom of choice of occupation for the pupils themselves. Class teaching is seldom an intelligent method except for lessons of the story or narrative types, where it is waste of time to retell the tale to everyone, and where also there would be a loss in effect from lack of the stimulus of a group of sympathetic listeners—a stimulus which of course affects the teacher as well as the taught. There is room also for ‘ discussions,’ but these generally arise naturally out of the work in hand and are more effective when the group discussing is a comparatively small one. There may also be room for ‘ demonstration ’ when a number of boys are puzzled about a particular point and can be dealt with together. For the rest, individual or group work seems in general the more natural method, and these are, moreover, the ways in which boys will be expected to work later on when they have left school.

Greater freedom and spontaneity need not, however, mean that specialisation should be allowed recklessly and that boys should, for example, freely give up mathematics to work at carpentry. It might however mean, and there is much in the study of children’s interests to support this view, that boys should be allowed to ‘ block ’ subjects to some extent, e.g. to do a good deal of history or carpentry while the interest in these subjects is keen, and then to do a good deal of something else. The chopping up of work into limited periods by a timetable is necessary enough under the system of class teaching where the criterion of fatigue and boredom

must be that of the weakest pupil—but it can hardly be regarded as natural, nor indeed is it a particularly good preparation for later life. Greater freedom might also mean some choice in the allotment of time—perhaps after a minimum standard in certain subjects had been attained—in addition to that practice in the use of leisure, whose importance we have emphasised. Schools should also provide opportunity in work hours for co-operation and for other activities connected with the social instincts which are at present only possible in games—a reform which might render superfluous the somewhat pathetic claim made for the public schools that at least ‘character’ is ‘trained’ and ‘developed’ on their playing fields.

CHAPTER IV

THE GROWTH OF HABITS AND SENTIMENTS

PROBLEMS connected with the formation of habits have always claimed a large space in educational writings, and the discussion of them often ranges over a wide field, including moral, intellectual and physical activities. The word habit itself is fortunately less ambiguous than many that are used in educational psychology; it is applied to that large class of automatic or semi-automatic reactions which are learnt in the course of experience. Habits are thus distinguished on the one hand from instinctive reactions which are unlearnt, and on the other from voluntary or purposive actions which require at least a minimum of thought. The possibility of forming habits at all rests on the fact that an action once done in a certain way in response to any given stimulus, tends, provided that its consequences were not unpleasant, to be repeated in that way the next time the same stimulus occurs. Habits grow up in various ways which deserve the teacher's consideration, since the formation of useful habits in his pupils is expected of him, and will indeed save him much trouble and friction. He also needs to know how far

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these habits can be relied upon when the pupil is placed in a somewhat different environment from that in which they were acquired.

1. Habits are formed in close connection with instincts, and are often the direct outcome of instinctive reactions. The instinctive impulse is in many cases sufficiently indefinite to be capable of satisfaction in a variety of ways. What inclines the child to choose any one of these ways in the first instance is for the most part inexplicable, though careful observation may give us the key to the problem in individual cases. Once chosen, however, that particular reaction is more likely to be chosen again next time, and so on, until it becomes a habit. We have already discussed this point and need only mention it here for the sake of completeness.

2. Habits are also formed as the result of purposive action by which we deliberately set ourselves to acquire a given facility or skill. In this case the process generally begins by a series of trials and errors until the successful act is performed more or less by chance; after this error often occurs again, but the correct action happens more frequently and is more easily recognisable, and the process goes on for a longer or shorter period until finally all the wrong acts are omitted and the action becomes both correct and automatic. Such methods of learning are familiar enough in cycling, playing games, such as tennis or cricket, sawing, and so on.

In other cases the right action is easily recognised from the first, but the learner is slow and uncertain in accomplishing it, and practice is directed towards attaining

speed as well as accuracy. Hammering in nails, typing, shorthand writing, playing scales may serve to illustrate this second class. In all cases, since practice makes the process more automatic, the attention is gradually set free and can be turned to other things. Thus when learning to cycle we gradually become able to notice the scenery, talk to a friend, or even read a book, and in games of skill we grow able to watch the movements of our opponent. To play such a game as tennis well involves the acquirement of a whole number of automatic reactions, any series of which can be started off by the mere decision where to send the ball. Most players have certain special strokes which they are generally able to accomplish successfully, i.e. in which the automatism is fairly perfect, and one of the marks of the feebler player is his inability to check his favourite stroke even when in that particular case it is merely playing into the hands of his opponent.

The facility with which any given skill can be acquired obviously depends largely on the development and control of the muscles. Hence teachers need to give heed to physiological evidence as to the age when the various muscles can be safely exercised and to determine what and when to teach accordingly. Much time is wasted if the child begins too young even if no serious strain results, and on the other hand facility may be lost by beginning too late. As a rule, if a child appears unduly slow or stupid in acquiring any given dexterity he should give up the attempt for a time, even if the occupation is one generally suited to his age.

Experimental investigation into the effect of practice on the process of acquiring some skill such as that of telegraphy or typing confirms what introspection leads us to expect, viz. that periods of good progress are followed by intervals of little or no improvement. Progress, in fact, is usually rapid at the beginning, then there comes a 'plateau,' as it has been aptly termed, where continual practice seems to have no effect, then another 'hill,' and so on, until the limits of the individual's skill in that particular direction, or of his perseverance, are reached. The same characteristics seem to mark progress in intellectual skills, such as learning a foreign language, and, incidentally, observation suggests that a baby's progress in learning his native tongue is of much the same nature. It must be noted that practice during the 'plateau' periods is not wasted, but is rewarded by more rapid improvement when the next 'hill' is reached.

It follows from this that in the numerous cases where practice is demanded in school work the teacher should be on the look out for the 'plateaus,' since it is at this stage that the child is likely to be discouraged, and to need more help or the stimulus of a varied treatment of the subject matter should this be possible. As long as rapid progress is being made the pleasures of success will be enough to carry most children along with but little attention from the teacher. Older children, too, like adults, may be encouraged if they understand that unevenness of progress is normal and that hard work during the unprogressive stages will be effective in the end.

3. Again, habits may be formed deliberately by voluntary repetition of certain reactions in response to certain stimuli. Thus, invalids in particular, healthy people to some extent, deliberately form habits of getting up and going to bed at certain hours, of eating certain foods at certain times, of taking daily exercise, and so on. In these cases there is no special skill to acquire and the process of trial and error is unnecessary. The automatic result is secured by repeating the act deliberately at first until gradually the thing works of itself. Some people are, of course, more forgetful or less determined in forming the habit than others, and hence the process takes longer and may never be quite so successful. Moreover, if the desired habit be even slightly distasteful the reaction never becomes really automatic unless custom removes the feeling of distaste. This explains why people who have got up at a certain hour for weeks or months may still not acquire a fixed habit of getting up at that time so that they do it without effort and as a matter of course. Repetition only leads to automatic reaction when the process is either indifferent or pleasurable.

Many of the habits formed by children are conveniently classed under this head because they are the result of deliberate repetition. But in a large number of cases the purpose for which the habit is formed is not realised by the child at all but only by the elders who see that the action is dully performed. In this semi-mechanical way children may form habits of putting away their toys at bedtime, of brushing their hair, of having a cold bath, and of carrying out a hundred other minor matters

of the daily routine. But the absence of deliberate purpose on the child's part may lead the educator to fail unwittingly in his attempt to make the habit permanent. This point is sometimes overlooked and deserves further consideration. The habitual action is learnt in response to a certain stimulus so that the sequence of stimulus-reaction is established as more or less automatic. The difficulty in the case of children who appear to have formed good habits is to find exactly what stimulus is influencing them. A parent, for instance, who had trained a delicate child to rest every morning before dinner believed that the habit was fixed and that the necessary stimulus was merely a reminder that it was twelve o'clock. But when the child was left in charge of a friend for a few weeks during her parents' absence from home, it was found that she frequently refused to go to rest and, if persuaded to lie down, often got up afterwards and played about. In this case obviously the mother's authority had been the really effective stimulus, and the habit formed was that of obedience to her wish and not that of resting before dinner. Mistakes of this kind are constantly made by so-called 'good disciplinarians,' whether parents or teachers, who believe that the children under their care are acquiring good habits of various kinds, whereas in reality they have formed one habit only, that of unreasoned obedience to the disciplinarian's will: their lack of general training shows itself in a depressing manner directly her influence is removed.

In other cases the stimulus seems to include and to

depend for its efficiency upon a certain environment in connection with which the habit has been formed. Hence the particular stimulus with which it is desirable to connect the reaction proves quite inadequate by itself. A boy of seven who was accustomed at home to look after himself in such matters as changing his shoes, getting tidy for meals, and so on, lost most of these useful 'habits' when he went away from home on a visit, kept on his wet and dirty shoes, came to dinner with hands unwashed or hair unbrushed, and in general required more reminders and attention in a couple of days than he needed at home in as many months. In this case the habits were connected too closely with his home surroundings, the place where he took off his shoes and the peg where he hung his coat, and with the normal routine of his home life.

Cases such as these are frequent enough and mark a relative failure in training. We want the changing of shoes to depend on the fact that they are wet and dirty, not on the aspect of the hall or lobby where they are generally removed, just as we want good manners and considerate behaviour to be habitual throughout a child's life and not merely while he is in school. And the failure in training may show itself in another way. The child who has formed excellent habits in connection with the routine of home or school may be less able to cope with a change in his accustomed environment than the happy-go-lucky child who has been brought up under less order'y conditions. If anything happens to interrupt the usual course of events the 'well-trained' child may be absolutely at a loss, his habits have been formed too mechani-

cally, and since he has never clearly understood the reasons for the various actions he has learned to do he cannot adjust his behaviour readily to different conditions. It is possible to train a child too well, if he has acquired his habits blindly, as most children tend to do, just as it is possible to feed him too carefully so that the least change of diet gives him a stomach-ache.

4. Finally, habits are acquired inadvertently. Chance movements made once or twice became habitual. These inadvertent habits often form a sort of fringe round skills deliberately learnt and round habits acquired through purposive repetition. We adopt particular mannerisms when we hold a stick or cup, or ride a bicycle, or dress and undress, and we even assume a particular facial expression when we play some game. Bad habits, so called, fall for the most part into this class, though some are directly connected with instinctive impulses and belong to class (1). Children bite their nails, frown, make faces, fidget with the leaves of their books, scribble on paper or on their desks, all more or less automatically and unconsciously. Such habits are specially difficult to get rid of when, like some of those just mentioned, they do not interfere with the child's attention and interest, or with the majority of the usual school occupations. A child can and does bite his nails while he is reading, or listening to a story, and even in the intervals of his play; indeed whenever his fingers are not actually occupied with something else.

Habits are useful and even necessary because they are automatic and thus free the mind from an obligation

to consider each action afresh whenever occasion for it arises; but this same automatism makes them harder to check or alter when they happen to be undesirable. In this respect they resemble instinctive activities, and there is the same objection to any attempt to cure them by making the reaction unpleasant *after* it has taken place. Each repetition of the sequence stimulus-reaction makes this sequence more fixed and automatic. Hence the important point is to prevent the reaction taking place, not to punish the child after it has occurred and after the sequence is rendered thereby slightly stronger. Moreover the automatic nature of the reaction prevents the child from readily stopping himself in time even when he knows punishment will follow. Thus to punish, after each attack of passion, a child who has acquired a habit of giving way to fits of temper may only serve to undermine his self-respect without helping him to self-control. The better plan whenever possible is to attack 'bad' habits either by removing or guarding against the stimulus or to prevent the reaction by some strong counter impulse. We may illustrate what is meant by reference to the habit of biting the nails. The stimulus to this seems to be a certain nervousness combined with unoccupied fingers. We may try to remove this stimulus on the one hand by special care of the child's general health, and on the other by keeping his hands occupied at moments when otherwise he is likely to bite his nails. In addition to this we may give some special inducement to make him wish to cure the habit. Many children have been cured of biting their nails by a present of a

manicure case. This not only provides fresh occupation for their fingers at odd moments but, more important still, arouses a pride and interest in the appearance of their nails which may prove a permanent safeguard. In nearly all cases of course the goodwill and co-operation of the child is important, the exception being where the habit may be made worse by self-consciousness. A shy, nervous child who is awkward and walks and holds himself badly may be made worse by any discussion of the matter, however much he wishes to improve. The best treatment here would be practice in gymnastics and dancing, where he will learn better control of his movements and a better balance, and meanwhile the avoidance of all reference to his awkwardness.

We must now pass on to consider a further and important development of the law of habit in the formation of what are called sentiments. A sentiment may be described as an habitual attitude of mind towards any object or group of objects or towards some abstract idea, which attitude grows up in the course of experience as the outcome of our instinctive activities and emotions and the general trend of our interests. A sentiment is in a sense compounded of a number of potential emotions and impulses, any one of which we may feel according to the circumstances in which we see or think of its object. Thus if we have the sentiment of love to any person, we not only desire to be with them but also we are likely to be angry with anyone who hurts them, afraid of any serious danger to them, and so on. Again, a patriotic person feels proud when he hears good of his country

and its inhabitants, shame when he believes it to be concerned in what is bad, anger and perhaps fear of those who attack it and gratitude towards those who benefit it. Other sentiments which are specially important in the case of children are those of dislike or hatred, *esprit de corps*, the æsthetic sentiment, the self-regarding sentiment, and the moral sentiment.

Now these relatively permanent mental attitudes necessarily develop slowly, and in the case of children in particular their growth is closely connected with the child's activities. Very young children, for instance, though they express delight in the presence of their mother or nurse and grief when she goes away can hardly be said to possess more than the rudiments of a sentiment of love. Later on, as the result of impulses of affection expressed in various ways, their attitude becomes more defined and permanent; they begin perhaps to show resentment towards anything that seems likely to hurt their mother and to make efforts to please her and to save her trouble, which show that there is an element of the protective emotion in their attitude towards her. The protective instinct indeed forms an important part of what we call the sentiment of love as distinct from the more passing emotion of love. This fact is a partial explanation of the strong sentiment of love which children often have towards their younger brothers and sisters, or towards their pets. Here the protective impulses are constantly aroused and satisfied by the stimulus to and performance of various acts of care and kindness,

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whereas in the case of elder brothers and sisters and parents there is comparatively little scope for the exercise of such impulses.

The most effective way to help children to form sentiments is thus to provide opportunities for the exercise of instinctive impulses in the required directions, a fact which has indeed long been recognised by teachers. To acquire such relatively permanent attitudes of mind is a necessary supplement to a training in good habits, and is the best corrective to those more mechanical forms of training which we criticised earlier in the chapter. The child's training to be really effective must be connected in his mind with some reason which he can understand and for which he learns to feel some sentiment of respect and appreciation. Without this the habit is unlikely to stand the test of time and changed conditions. The habit of neatness, for example, has been so continually encouraged in and even forced upon children that were repetition alone enough there could hardly be any untidy man or woman left. The process fails because few children see any reason for tidiness beyond that of necessary obedience to authority, and have no sentiment in regard to the idea of tidiness unless one of distaste aroused by unwise insistence on irksome rules. In such a case the educator needs not merely to enforce rules, however necessary something of this may be, but to make sure himself exactly why such rules are necessary and to consider whether the child can appreciate his reason. The two most obvious reasons for tidiness seem to be consideration for others and æsthetic feeling. All

children can understand the former reason, and the social instincts supply the basis upon which may be built up a sentiment of goodwill towards their fellows which includes a dislike of anything that gives other people unnecessary trouble. Where the trouble saved is only that of the individual himself the matter is less important and the need for tidiness is probably best learnt, if learnt at all, by experience.

Most children, too, can understand and appreciate the æsthetic reason for tidiness. But the æsthetic sentiment, like other sentiments, develops best in connection with the child's activities. It is in fact merely an habitual attitude of mind towards the objects round us which prompts us to look at them critically and to enjoy and try to preserve those we judge to be beautiful and to dislike and try to remove or improve the others. In children it is encouraged best by letting them share in actual attempts to make their surroundings beautiful, allowing freedom for their own taste to develop, however crude their judgments may seem. Hence it is easier for them to prefer to keep a room tidy if they also help to make it look beautiful by the growth and arrangement of flowers, the choice of pictures, and so on. The school tidiness, which often consists in putting away ugly books and papers in ugly desks in an ugly room, is but gloomy and ineffective training for anyone. If, however, the class has some voice in the selection of pictures out of the school stock, and in their position on the walls, and is allowed to share in the choice of distemper or paint whenever opportunity offers, there is likely to be some

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pride taken in the room and some pleasure felt in keeping it tidy. In one school, for example, it was found possible to use white paint throughout for the woodwork because the children's pride in its appearance was sufficient to make them avoid rubbing against it or marking it.

The sentiment of kindness to animals again needs to be connected with the training in habits of consideration and care of animals. Nature study, with its handling of all sorts of creatures and its investigation of their life, does much in this direction, and the care of school and home pets does even more. Here, too, it is the attitude of mind that is needed, and that must be developed and strengthened by actual opportunities of expressing the protective and other suitable instincts.

Habits which depend on special stimuli may, as we have pointed out, be lost completely after the child leaves school and may even be deliberately unlearned if the atmosphere in which they were formed was uncongenial, but sentiments when once acquired are harder to efface. Many of us, indeed, retain certain sentiments which we acquired in childhood and at which we are now mildly amused even while we acknowledge their influence.

In the natural course of development sentiments will grow up first in relation to individuals. Later they may be extended to include a class or group, as some children, for instance, pass from an interest in their baby brother to a sentiment of love towards babies in general. Finally, we may form sentiments towards abstract ideas and become lovers of humanity, or haters of oppression and injustice. It is evident that most children's sentiments

will be of the first class, and this fact is important in determining what special activities are likely best to develop any desired sentiment. A child who willingly shared his tea with a young crossing-sweeper would probably have advanced much further towards the sentiment of fellow-feeling and sympathy with those poorer than himself than if he had sent whole boxfuls of old toys to Dr. Barnado's Homes or the Waifs and Strays. And this not because the sacrifice in the second case is not a real one for many children but because they cannot realise the result of their action clearly enough. It is unfortunate that hygienic reasons often stand in the way of the more concrete acts of kindness, but some of these may be possible without of course neglecting to send away the toys too.

With the approach of adolescence there comes the possibility of forming abstract sentiments, but the consideration of these may be deferred to a later chapter.

CHAPTER V

ENVIRONMENT AND SUGGESTION

For the purposes of this chapter it will be convenient to use the word environment to denote all the external circumstances that surround and influence the child, whether at home or in school, but not any direct teaching or instruction he may receive. In the widest sense of course the word would include such direct teaching. It will also be convenient to distinguish suggestions conveyed by the environment from those conveyed by the teacher.

Modern theory has no claim to have discovered the importance of environment and many valuable suggestions on the subject are to be found in the earlier educational writers. But it has nevertheless been neglected in schools and particularly in the primary schools, a fact explained in large measure by the history of these schools and by their eagerness to provide much-needed instruction. Now, however, that we have recovered from our just amazement and delight that nearly every child in the country should have an opportunity of learning reading and writing, we are beginning to recognise the importance of providing a suitable environment as an

assistance to learning these and other things. Evidently, too, the influence of environment must be relied upon to a greater extent under modern theories of education than when schools were places where the child's chief duty was to "mind his book." At present, it is true, we have no adequate knowledge of what is due to environment and training and what to inheritance. But even granting that the child's chief bent and tendencies are determined at birth by the differing strength of his instincts, by his temperament, and so on, it yet remains for the environment, aided by the suggestions and teaching of elders and contemporaries, to provide outlet for these tendencies. The natural strength of a tendency may determine whether or no it develop under adverse circumstances. Genius is popularly supposed to show itself under the most unfavourable conditions, but talent at least may be lost or damped by the absence of sympathy or the pressure of counter-suggestion. Even on this view then, where much is supposed due to inheritance, environment yet plays an important part. If it cannot produce a tendency it can stimulate, strengthen, and direct it.

On the other hand, it may be that environment is even more powerful. Many native tendencies (so called) may really owe their development to suggestions and opportunities which have guided instinctive impulses common to all normal children into these particular forms. The 'imaginative' child may owe his facility in make-believe games to an illness which prevented him from taking part in the constructive and inventive pursuits which seem to fascinate his brother, and threw him

back to quiet games with dolls and tea-sets. This brother, too, may owe his keen interest in 'making' things not so much to the special vigour of his constructive instinct as to the fact that bricks and sand were his most readily accessible toys in early childhood and that his parents were genuinely interested in his constructions, whereas they felt, half unconsciously, that the imaginative games were 'silly.' The difficulty is to collect enough sufficiently careful observations and records of the origin and subsequent history of children's favourite games and occupations. Once even a slight interest is formed in any one direction the law of habit will, as we have seen, tend to increase it and make it permanent. Moreover, relatives and friends naturally encourage such developing tastes provided that they are harmless.

More evidence is essential before either of these views can be definitely accepted, but in either case the influence of environment is considerable and is well worth the teacher's consideration. It must consequently be part of the educator's business to study the child's environment critically and try to devise means of improving it where necessary.

This point may be illustrated by examining the opportunities afforded to a child's instinctive impulses in homes of different types. Take first a middle-class household, fairly well-to-do but where no servant is kept. The father is at business all day and the child spends most of its time with its mother and shares her household interests and activities, which it afterwards imitates in its play. There is a small garden where both parents

work and where there is a chicken-run. Here, too, the child 'helps' and repeats the activities observed, in play or in its own little plot of ground. Such an environment provides a suitable outlet for many of the activities of a young child. Household matters, the garden, and the chickens stimulate its curiosity and it has numerous models for imitative play of an intelligent kind. A sand-pit and bricks for building, and chalks for drawing, are easily provided in addition. The weak point is likely to be in respect to music and dancing and possibly in the supply of suitable picture-books and stories by which wider and less personal interests may be aroused.

Schools for young children should be able to provide an environment of something of this nature without difficulty. The household duties may lose some reality and become for the most part games with a doll's house. But better facilities for keeping pets, for an aquarium, and for more varied constructive work will partly compensate. Obviously music, games, and dancing can be much better provided for than in any but an exceptional home.

In another home of similar social standing we may find that the parents have few or no interests which will usefully stimulate the instinctive tendencies of their children. The mother perhaps hurries over her household work and discourages the child from helping her; the garden is neglected, and there are no chickens or pets. The child's curiosity is chiefly stimulated by hearing 'gossip' about his neighbours. The parents do not understand his need to make and do things, and he

probably satisfies this by messing about with the water-taps or other people's belongings whenever he gets the chance. In this way he often does damage and grows accustomed to being scolded as a sequence to his most interesting games. A child under these conditions develops little intelligent interest in his surroundings, and is lucky if he acquires nothing worse than a love of mischief and a certain hardihood in braving punishment. Analogous mistakes are sometimes made even in schools for young children, where, as we have said, the provision of a suitable environment should be comparatively easy.

As children get older more is demanded of their environment. For one thing their constructive tendencies should become more definite and the sand-pit and brick-box are no longer adequate. Tools and material for wood-work are perhaps required or help in making dolls' clothes or in drawing a map of the neighbourhood. Then again the child's curiosity should take in ever-widening fields as well as deepen along the lines of his dominant interests, and should be satisfied both by personal investigation whenever possible, and by reference to books. The difficulty is that his interests are becoming more specific and he needs specific material, whereas in earlier childhood a few adaptable toys satisfied his indefinite requirements. Some homes can still provide much of what is needed at this stage, but many fail because the interests they encourage are too one-sided. What the child seems to need now is not necessarily much direct teaching, but rather endless opportunities to 'do' things, combined with material to enable him to 'find out'

what he wants to know. Books to look at and someone who knows enough and is sympathetic enough to help him and tell him stories will provide stimulus in respect to literature, history, and geography. And walks, whether in town or country, with opportunities for discussion, investigation and questions, will help to interest in Nature Study and the elements of science. Similarly the environment should provide some stimulus and outlet in the various other directions into which we wish to guide the child's interests.

Unfortunately school environment is apt to fail completely after the infant school or Kindergarten is passed. We have already criticised the neglect to stimulate and use the social instincts. But apart from this the school tends to rely too much on the direct efforts of the teacher instead of preparing the way by suggestive surroundings which give opportunities for development but still leave room for freedom of choice and individual initiative. The teacher is thus handicapped by the unstimulating character of the school environment. He has to begin his subjects as it were from the beginning and laboriously build up an interest, whereas under more natural conditions the children would have a hundred developing interests ready to his hand, and the only difficulty would be which to choose for his particular purpose. We have already described one of the ways in which a child may travel naturally from an interest in building and the arrangement of houses, to the making of maps and the arrangement of countries and geographical features and thence to a wider interest in geography. Other children

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will approach the subject in other ways. One child, for example, was inspired with keen interest in the map of Great Britain through an interest in motor-cars and their letters. Various methods of approach readily suggest themselves, and the child's environment may be prepared accordingly. Introspection and observation will suggest similar natural approaches to other school 'subjects,' and attention to these preliminaries will repay the teacher both by an increased initiative and energy on the part of his pupils and also by their ready grasp of fresh ideas.

We can here only point out a few of the ways in which school environment might be improved. Many evils are attributed to large classes in primary and in some secondary schools, but what is perhaps even more desirable than a great reduction in the size of the classes is that each class should have two rooms at its disposal, the one for quiet work, reading and writing and most of the actual teaching, and the other for handwork and constructive work of all kinds, and possibly for science. In this latter room bits of work could be left unfinished without being in the way, some noise would be allowable and free time could be pleasurably and intelligently occupied. Such a plan would make it easier to encourage group work and independent work of various kinds, the need for which we have already discussed. Then books of reference and books and pictures likely to interest children of various developing tastes should be readily accessible to be looked at in spare moments or in pursuit of some special interest. Children in bookish homes no

doubt often learn to spend too much time in reading because they perhaps lack stimulus for their more active impulses. But at any rate they readily acquire a habit of referring to books for information ; yet teachers often fail to cultivate this habit in their pupils in school in spite of much expenditure of time and energy. In a case like this while something may be attributed to inherited taste yet the difference in effort and result must be largely due to the total lack of stimulus in the school environment which throws the entire burden upon the teacher's direct efforts.

In some cases no doubt, and this especially in the primary schools, expense is a serious consideration, but even here something might be done if we could forgo such demands as that, for instance, every child in a class should be provided with a copy of the reading book so that fifty children may follow in their book while the fifty-first reads aloud.

Environment in the sense in which we have used it is, however, not the whole of the matter. Direct teaching and suggestion are also needed. With the former we are not concerned here, but the word suggestion occupies a prominent place in some recent educational writings, and the idea embodied in it is sufficiently important to deserve further discussion.

Suggestion, imitation, and sympathy have been called pseudo instincts because the tendencies denoted, although they appear to be innate, are not accompanied by any specific emotion such as we find in the case of instincts proper like fear or anger. The three terms are used

variously even by psychologists, and the lines of distinction between the three are difficult to draw in practice. Roughly, however, they may be taken to denote those tendencies in human beings which incline them respectively to take over thoughts and beliefs from their fellows, to copy their acts, and to feel what they appear to feel,—without any deliberate purpose and without any reasoned process of thought. Illustrations of these tendencies may readily be supplied. Children acquire accent, gesture, and manners from an imitation, which is mainly unconscious, of those with whom they live. They also readily adopt the beliefs of their elders through suggestion, accepting them with an absence of criticism which justifies the phrase a “child-like faith.” Similarly children readily develop ‘sympathetic’ fear if the person with whom they are shows signs of fright, although they may not know the cause. If the cause is known the case becomes one of suggestion and the child will adopt the suggested belief, say, that “all cows are dangerous” and may hold to it tenaciously in spite of much evidence to the contrary. It may be added that many specific fears often explained as ‘instinctive’ are in fact probably acquired in childhood through suggestion and sympathy. Such are possibly fear of the dark, fear of touching creatures like worms and slugs, and almost certainly fear of animals, particularly of cows and dogs. Childhood might be a much happier period if people could refrain from inadvertent suggestion of danger and could also deny themselves the pleasure of witnessing the thrill caused by exciting stories of wild animals, hunting, rescue

from fire and so on. The small child often delights in such stories at the time, but they leave him the victim of untold horrors when he is left alone, and especially at night. Older children, who can better estimate the probability of danger, can enjoy stories of this kind without so much risk that the suggestions conveyed will cause them subsequent misery.

We are here concerned primarily with suggestion, using the word to denote the process by which an idea or proposition is conveyed from one person to another and is accepted without adequate logical grounds. We shall not attempt, however, to mark off the numerous cases where imitation and sympathy are also present.

The suggested idea may be conveyed by words, gestures or looks, but the essential characteristic is that no attempt is made to offer a reason for believing it and that the recipient accepts it in the same spirit. The success of the process depends: (1) on the skill of presentation; (2) on the prestige and authority of the suggestor; (3) on the state of mind of the recipient. Knowledge of the subject concerning which the suggestion is made must generally be absent or at any rate not readily called to mind, otherwise a process of reasoning is likely to be set up. Contrariant ideas too must be absent, or not sufficiently powerful to offer serious opposition to the suggested idea, otherwise it will either be rejected forthwith or the opposition may lead to a reasoned examination of the matter and to a more or less logical acceptance of one or the other.

These conditions make it obvious that children, as a

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rule are specially suggestible. They accept suggested ideas without serious opposition and often regard them subsequently as their own. They also hold to them with a tenacity which they cannot justify and with an emotional tinge which is often effective in leading to action. These actions must be distinguished from those due to direct command, on the one hand, and from those due to reason on the other. With regard to the latter it should be noted that a child often thinks and acts reasonably although his conclusions are incorrect owing to inadequate knowledge and to his inexperience, which leads him to overlook the probable existence of unknown factors.

In spite of their normal suggestibility, however, children, like most adults, display at times a tendency to contra-suggestibility, that is, a tendency to accept without reasonable grounds the opposite of any idea suggested to them. This may be due to an unusual amount of self-assertion, or in some cases to a kind of nervous irritability, probably due to physical causes, and which makes them equally inclined to resist commands or requests. Even in such cases both children and adults often accept the suggested idea ultimately though not at the moment when it is presented. It is also possible to make the suggestion with sufficient skill to avoid rousing the tendency to opposition.

The important effects of suggestion in school can hardly be overlooked. For one thing much of the so-called tone of the school will on analysis be found to arise from suggestions conveyed with all the prestige of

the elder and more prominent boys to the others. Good or bad tone sometimes spreads in this way from a specially influential group of boys until the effects are felt throughout the school. An extension of the process of suggestion is found in the prefect system as it is carried out, for instance, in many large boarding schools. The system works most effectively when the prefects are on friendly terms with the head master (or mistress) whom at the same time they respect, so that he can readily convey suggestions to them concerning government and behaviour. The prefects in their turn must be themselves admired and liked by the majority of the other boys, or their prestige will be insufficient to make suggestion work smoothly and unconsciously, and friction is likely to result from their attempts to enforce their wishes.

Suggestion too is the basis not only of the tone of the school so far as discipline is concerned, but also of the attitude of the boys towards work and games, of their interest in certain subjects, and their dislike for others, and of a hundred other matters which affect the general efficiency of the school. Some of these suggestions come from the masters, others from the boys themselves, but in all cases the process is an unreasoning one, and the boy who holds a reasoned opinion on any of the subjects in question is the exception.

Now all this is in many respects good, and much of it is probably inevitable, but the process has obvious dangers, and these are apt to be greatest where suggestion seems most effective. And first the suggestion may be no suggestion at all but in reality a command, and the

form of words may blind the teacher, and occasionally the onlooker, though usually not the child, to this fact. This is apt to happen in schools for young children where the influence of the teacher is great, and often indeed quite justifiably so. Suggestive questions as to occupations, "Would you not like to do this?" "Would you not like to make so-and-so to illustrate the story?" are naturally followed by a polite chorus of "Yes." No child in the class has regarded the question as conveying anything but an order. Indeed the teacher herself has no alternative in view, because she is so used to her pupils' ready assent. In one such case where the children, less docile than usual, answered "No," the teacher feebly replied, "Oh, but I think we had better do it."

Even when this particular mistake is avoided the use of suggestion to stimulate interest and to lead the child into special activities may easily be excessive. On the surface the results are often excellent, the child is unconscious or barely conscious of control and he takes a keen interest in his lessons. The final effect, however, is to make him over-dependent on the teacher and unused to exercising his own judgment. He responds readily to the teacher's suggestion but is allowed no time to think out things and still less to react on his own initiative to the stimuli which should be present in every school environment. Still worse results sometimes occur when the teacher wishes to make the child think and reason. Thought by its very nature must work independently, and in children and even in adults the process is a slow one. Yet quite difficult reasoning processes are some-

times demanded of a class of children in the short space of a single lesson. It is small wonder that the eager teacher tries to hasten the process by subtle suggestion conveyed in questions, or by direction of observation, or merely by gesture. Thus he deceives himself into supposing that the pupils are really thinking and even inventing. In reality the children are at best only following another's thoughts, and the more 'skilful' the teaching the more dependent do they become. The conclusion reached finally is that at which the *teacher* aimed and gives a correct solution of a problem only half understood by the class. Throughout such teaching the child's interest is mainly or wholly due to the teacher's influence. He will not occupy himself with the subject out of school, and he will not be able to work out similar bits of reasoning by himself. Such over-suggestive lessons must be condemned as encouraging directly a slipshod tendency to accept other people's reasoning which will later make the man an easy prey for the politician and the despair of the statesman.

Legitimate suggestion is easily recognised by its results; it takes hold of the child, as it were, and leads him without further attention from his teacher to follow out the subject for himself, and he will show by his activities and by his questions that he is following it out. And this result is due not to any magic skill in the way the idea is presented to the child, nor to the prestige of the suggestor, but to the mere fact that the suggestion stimulates instinctive tendencies or previously developed interests. Anyone who has had to do with children at home knows

the difference between the suggestion which takes hold and keeps hold and the one which attracts for the moment or so long as the suggestor is present, but ultimately falls flat. Unfortunately in school the teacher's suggestions are too seldom allowed to fall flat, rather they are artificially kept alive by further stimulus.

Something of this no doubt is due to bad conditions of teaching. The teacher too often works under conditions devised to suit the educational methods of fifty or a hundred years ago, whilst his own views of good method have completely changed. He works in classrooms and with equipment suited only to demonstration and lecture lessons, while he aims at individual treatment. He often achieves much, but it is no wonder if sometimes his criteria of good teaching grow confused. Interest during the lesson and order maintained without friction are good in themselves, but they may nevertheless be arrived at by teaching that is definitely bad, and that will leave the child lacking in power to interest himself outside school and dependent on others to stimulate and guide his thoughts.

Finally it is the educator's ambition to encourage reason and independent thought, yet in spite of this the majority of children leave school with a mass of ideas on politics, art, morals, and religion, which they have acquired by various processes of suggestion, about which they have never been expected to reason seriously, and criticism of which has been checked at the outset. We should laugh at a teacher who conveyed to his pupil by suggestion a belief in geometrical theorems or in

Boyle's law. The very fact that differences of opinion are frequent in relation, say, to art and infrequent in relation to elementary mathematics and science should make us beware of dogmatism: yet it has an exactly opposite result. We are afraid to let the child strengthen and test the foundations of his beliefs in those very subjects where he is most likely to meet with opposition and contradiction in later life. Thus the boy or girl goes out into life with no notion of how to form an intelligent opinion on any of these subjects and even with no notion that his own opinions are not based upon reason. Then he finds that opposed beliefs are held equally tenaciously by companions whom he respects. And if this happens during adolescence when reasoning powers and critical tendencies, and often an unreasoned opposition to early tradition are strong, a tragic day of reckoning may come. The more effectively the beliefs were inspired by early suggestion the more he will suffer in casting them off or modifying them, and the less unprejudiced he is likely to be in the process. Not infrequently the final result is a tenacious acceptance with equally little reason of opinions diametrically opposed to those his teachers have so carefully inculcated.

It is certainly a poor tribute to our own beliefs if we dare not present them except by blind suggestion. And if we justify ourselves by the reflection that the child's reasoning powers are so limited that his conclusions, if he is encouraged to independent thought, must generally be false, we should remember that such false conclusions can be readily corrected as he grows older and

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learns to reason better. The habit of accepting other people's opinions uncritically is easily learnt and hard to break, whereas independent thought will always be sufficiently repugnant to a social creature like man.

Part II

CHAPTER VI

EXPERIMENT IN EDUCATION

EXPERIMENTAL psychology is a comparatively recent development of psychological science and as such has been subjected to severe criticism, but the results already attained are fully able to justify it. Some of these results, such as those connected with memory and association, are of direct importance in educational work and many others are indirectly suggestive, so that it is small wonder that experimental work carried out with children and often actually in the schools is a rapidly developing method of investigation. Experimental education has, in fact, become so important of late years and it looms so large in the eyes of the public that it is well to consider the exact nature of its claims and what may reasonably be hoped from it.

In the first part of the book we have made a number of general statements about children, their instincts, their development, how interests grow and how purpose and control grow. These generalisations have been arrived at by psychologists partly by study of adults,

children, and animals; partly by introspection, i.e. analysis of their own individual consciousness; and partly as, for instance, in the case of animal instincts, by experiment. These and other similar generalisations constitute an attempt to describe and partially explain the common features underlying human nature as such, and in so far as they are correct, they enable us to infer how individual children are likely to behave under certain conditions—so long, that is, as we keep to broad lines and expect details to be determined by individual peculiarities. And it is this knowledge which supplies the basis of our educational theory. Now experimental education aims at supplementing and extending, or it may be correcting, the broad general theory by investigations with groups of children or with individual children, under certain carefully prescribed conditions, and by testing and extending the results of these investigations by the aid of the mathematical and statistical sciences.

To experiment means intentionally to alter or produce certain conditions in which the thing observed functions, in order to observe its procedure after the change. We often use the word in this broad sense. For instance, we say that a small child ‘experiments’ when, after seeing milk given to the cat, he offers it the piece of grass with which he was pretending to feed his toy horse. And from one point of view all education is experimental, since teachers are continually altering their methods and watching the effects of the change upon different children. The teacher’s attitude, however, can seldom be that of the scientific experimentalist. He works with a definite

practical aim in view ; he wants, for example, to interest an inattentive child, and he tries throughout the lesson various ways of appeal until perhaps at last he succeeds and attention is secured. But his preoccupation with the practical aim leaves him little time to note data which are not directly concerned with the result, and the data he does gather may be so sketchy that he cannot explain exactly how that result was arrived at. He cannot say positively this happened under such and such conditions because of that other thing which I did or made the child do. He cannot even say whether the final attentiveness of the child was a cumulative result due to the combined effect of his successive appeals, or was caused by his final effort, or by something quite different, say, the removal of some distraction, which he had not noticed at all. Still less can he say that a similar method will be effective another time with a different child or under different circumstances. No doubt a teacher with wide experience who has formed a habit of criticising his methods may approximate more closely to scientific knowledge, but his statements must remain empirical, that is, he knows that his procedure has been successful in certain cases and unsuccessful in others, but he does not know enough of the conditions to make sure how far his successful methods would prove generally successful or what exact causal relation has been involved.

Scientific experiment demands a more definite procedure if we are to arrive at knowledge of cause and effect in the particular cases examined and to determine the possibility of basing trustworthy generalisations upon

these results. We may now consider what are the characteristic features of such experimental work and how far these are present in experimental education.

1. We must have adequate knowledge of all conditions present which are relevant to the particular point we are investigating. This is best secured by preparing the conditions, as far as possible, to suit our special purpose. And to do this we must be able to recognise and guard against probable disturbing factors. Thus if we wished to find out by experiment whether a group of children are more tired after a lesson on arithmetic or after one on gymnastics, we might arrange that the two test lessons should be given at the same time of day, that the previous work of the children that morning, and possibly the day before, was similar on each occasion, that the lessons were of equal length and given under like conditions as regards ventilation, temperature and general comfort. After thus ruling out certain probable causes of difference apart from the effects of the subjects themselves, we should be more justified in supposing that any difference of fatigue shown by the fatigue tests given after the lessons was partly or wholly due to the difference in subject. Moreover should it be necessary for different teachers to take the two lessons we should have to devise means for checking by some further test the effects of their differing personality and methods. Or we might adopt a different plan and test the children's fatigue both before and after each lesson, measuring the increase in each case. But unless the initial fatigue was approximately the same in each case this would obviously be a

less satisfactory plan, since the fatigue effects of a given subject may be expected to vary considerably according to the children's condition at the beginning of the lesson.

Other sources of error will probably occur to the reader, but we need not give further illustrations. Clearly, however, any failure in the preliminary analysis of the possible disturbing factors, or in care in preparing the experiment so as to rule out or check the effects of these may lead to the fallacy of inferring that a merely accidental or irrelevant factor has actually produced the result observed. Thus in the above example we might conceivably ignore the fact that although the same teacher took both lessons yet she was so much more interested herself in, say, arithmetic than in gymnastics that her keenness infected her pupils, causing them to work much harder in the former lesson and to be proportionately more fatigued. In this case, of course, the excess of fatigue will really be a measure of the teacher's extra efficiency, and may not depend at all upon the difference in subject as such.

A little reflection will show that completely adequate knowledge of the conditions can only be secured in the so-called exact sciences, where the phenomena studied can be isolated in the laboratory and be kept free from all irrelevant disturbing factors. Directly experiments deal with living beings the problem inevitably becomes more complex, and the more developed and delicate the organism the more difficult is it to analyse successfully all the conditions which may affect the results. There is no need to conclude from this, however, that any

attempts at exact results are necessarily fruitless, as some writers are inclined to do. But the difficulty of the problem should be recognised. Repetition of experiments, under the same or slightly varied conditions, the testing of large numbers of cases in order to cancel individual peculiarities, comparison of results obtained by different experimenters and the use of mathematical devices for calculating and checking probable errors, all these and many other precautions can be used in experimental education according to the nature of the work. Above all, every result needs to be severely criticised and checked and every suggested source of error investigated, and until this has been done any conclusions inferred from it can only be regarded as working hypotheses, useful enough in many cases, but which yet require further confirmation.

Analogous difficulties are found in experimental work in such a science as biology, but in one respect experimental psychology is peculiarly complicated. We are here not concerned only with external factors but also with the mental states of the individual himself, and these mental states can only be partially inferred by the experimenter from their outward expression in words or gestures. In experiment with adults introspective evidence is a valuable and indeed almost an indispensable aid, but children are necessarily both less skilful in the process of introspection and less able to describe their experiences accurately. Difficulties of this kind can be partially overcome in practice as the experimenter grows more experienced and learns to distinguish the cases where

the child's introspection is likely to be valuable. But on this account, amongst others, inexpert and amateur experiments are here specially unreliable.

2. We need sufficient knowledge of the material upon which the experiment is made to know whether it can fairly be taken as a sample or as typical of other partially similar material. Here again, in dealing with living matter the exact similarity found in the physical sciences is unattainable. Hence the use of the words sample or type. The concept of sample is familiar enough in commercial usage to require no special explanation, and we use both it and 'typical' in medical and sociological generalisations, as, for instance, when we assert that the death-rate in a slum district cannot fairly be taken as a sample of the death-rate of the whole town. Or, in other words, that the slum district is not typical of the town as a whole, though it may possibly be typical of slum districts in a number of other towns.

The problem of determining how far, and in what exact respects, any group of children may be taken as a fair sample of other groups is perhaps one of the most difficult in experimental education. Yet obviously the value of any general conclusion that we seek to draw from our experiments will rest upon the degree of accuracy with which this problem is solved, and neglect to realise this is likely to be a fruitful source of fallacy. In the present state of our knowledge, for example, it is not too much to say that the results of experiments with children of a certain social standing can hardly ever be assumed true of children of even a slightly different

standing, or of children of similar standing but different environment, who live, say, in a small county town, instead of in a city. In such cases if a general result is desired the experiments must be repeated under the different conditions which it is desired to include in the generalisation. Exceptions to this may be found in such cases as those of tests made in reference to rote memory, a semi-mechanical power whose functions are probably little affected by experience. In tests concerned with logical memory, on the other hand, the different past experience of the children as affected by their different social standing would clearly be a relevant factor.

3. Experiment must always be recognised as a part only of general educational science. We sometimes speak rather misleadingly of the 'experimental' sciences, as though in fact any science could depend for its data entirely upon experimental methods. Some sciences, it is true, owing to the nature of their material, can use experiment much more widely and effectively than others. But in all cases the procedure of investigation is a lengthy one, experiments only form one link in the chain, and their results, until they are connected up with the general body of knowledge which forms the science, must remain empirical and of limited value. Roughly speaking, the procedure is somewhat as follows: We must first have preliminary knowledge obtained from observation, or perhaps from earlier experiments, or inferred from the general laws which we believe to apply in the case we are considering. This knowledge must be adequate to enable us to form a working hypothesis as to some causal

relation which we wish to investigate. Then follows a stage of careful reasoning. If this hypothesis be true certain results will follow in such and such cases. Do they follow in fact? In some cases the hypothesis can be partially or even wholly tested by observation without experiment, or at least without any but the simple experiments in teaching to which we referred at the beginning of the chapter. And until lately educationalists relied upon such tests entirely. But evidently in many, probably in most cases, the difficulty of analysing the conditions present was too complicated to allow of results being obtained with much degree of certainty, and indeed the lack of agreement in educational practice is to some extent a witness to the uncertainty of these results. Moreover, in numerous other cases no adequate test could be obtained without devising some means to rule out disturbing factors by the arrangement of special conditions, which could not be secured in the ordinary course of school life. Hence the importance of experiment. The experimentalist starting from his working hypothesis devises conditions which will test its truth, and then proceeds to reproduce these conditions in actual fact and examine the results. In this way he can study the causal relation which he is investigating with a minimum of disturbing factors. And by repetition of the experiment in varied conditions he may be able to rule out these possibly disturbing factors altogether, or to estimate their effects with practical certainty. Even when this has been done the hypothesis needs further testing under different conditions. Meanwhile, should

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the conclusions provisionally arrived at have a direct bearing on actual school method, they can be further tested by putting the new method into practice and determining whether its effects are what were expected or whether there are variations which need explanation. Further, deductions from the provisional conclusions may help to explain facts not directly connected with the experiments hitherto tried, and in this case fresh experiments will probably be desirable as an additional test.

We may illustrate this procedure by reference to the teaching of reading. The old method of teaching reading by learning first the names of the letters and then combining them into words of two and three letters, and so on, was obviously the result of a consideration of how adults *spell* words rather than how they *read* them. A closer study of the psychology of reading led to a recognition of two facts. First, that adults who read fluently do not analyse the words into letters at all, and that in rapid reading the sentence or phrase is the unit rather than the word. Second, that as letters are sounded in certain ways quite distinct from their names, and the spelling of words is based upon these sounds, reading can be approached more intelligently by learning the sounds of the letters rather than their names, and building up the words from these sounds. These two conclusions led each to a new method of teaching reading, the 'Look-and-Say' method and the phonetic method respectively. The phonetic method is necessarily complicated in a language like English, where only a proportion,

though a fairly large proportion, of the words in common use are spelled phonetically, and where some of the letters represent several different sounds. Nevertheless, its advocates claimed that the gain in intelligence was more than proportionate to the loss due to these irregularities, and various devices were introduced which aimed at lessening the difficulties. Of these the Dale system is the best known and the most carefully worked out.

At this stage, then, we have two opposed groups of theorists each asserting that their method was the best. The only test of these claims was the results obtained in the different schools where the methods were used. From these, as might be expected, no final decision could be arrived at. Some teachers preferred one method, others another; many used a combination of both. Moreover, many children learnt to read well in most of the schools in spite of the variation of method, as indeed they had managed to do even under the old alphabetic system. Clearly, then, the method of learning to read was only one amongst many factors which influenced the progress of the children and experiment was the only means of deciding the conflicting claims of the different methods. Some interesting experimental work has already been done in connection with this problem, and possibly a decisive conclusion may shortly be arrived at. For the purposes of this illustration, however, we need only point out some of the conditions necessary in order to experiment and some of the difficulties that arise.

In this case there are two working hypotheses put forward, and the problem is to find an experiment which

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will decide between the two. At first sight the simplest plan appears to be to take two groups of children, living under similar conditions and who have not begun to learn reading, and to teach one group by one method and the second by the other method. Difficulties would probably arise in selecting groups of approximately equal ability with reference to a literary subject like reading, when owing to the conditions of the experiment it is agreed that they shall have done no previous work of this kind. Such difficulties might, however, be practically overcome by duplicating or triplicating the experiment. A much more serious source of error is the length of time over which such an experiment must extend before any decisive result can be attained, because conceivably one method might be more successful during the first few weeks, whilst the other ultimately proved the best. During a period of time extending beyond a few weeks obviously many other irrelevant factors are likely to appear which will influence the result and whose effect can hardly be checked. Hence it might prove advisable either to abandon this form of experiment or to supplement it by others extending over much shorter periods. These experiments might be made with children who had already begun to learn reading, so that they could readily be divided into groups of approximately equal ability with respect to that subject. The method now generally followed in making such a division deserves a brief description. A test in reading (or whatever subject is being used for the experiment) is given to the whole group of children. The children are classified in order of merit

and arranged in three groups, A, B, and C; the first child on the list being placed in A, the second in B, the third and fourth in C, the fifth in B, the sixth and seventh in A, and so on, till the list is exhausted. This preliminary test may of course be repeated two or more times to ensure greater accuracy. The three groups could then be treated as follows: A taught by the Look-and-Say method for a given number of lessons, B taught by the phonetic method for a like number of lessons under as nearly as possible similar conditions, C given no reading lessons at all. This third or control group is needed to check the amount of progress, if any, which results from natural development and general school work. Finally, the three groups should be tested again and the results compared. Two difficulties are, however, at once apparent. In the first place, previous methods of learning may affect the final result. If, for example, these methods have been chiefly phonetic the progress made by group B may be partly due to familiarity with that type of teaching. This difficulty could be avoided by using six groups of children, three previously taught phonetically, and three by the Look-and-Say method. A more complicated question is what exactly we can test accurately in reference to a subject like reading. Good reading includes technical ability to read the words, fluency, intelligence in phrasing and understanding of the subject matter. Of these only the first readily lends itself to accurate numerical marking, and this would probably be all that could be tested in an experiment such as this. But in granting this we open up a variety of problems

for further investigation. The Look-and-Say method, for instance, may teach children to read, as adults do, with continual reference to the context and to the meaning of what they are reading, whereas children taught phonetically may dwell too much on each word and fail to get the general sense. If this were so the latter might progress more rapidly in technical skill and yet might read less intelligently than the former. Hence the result of the experiment could only be stated in terms of technical progress and could not be regarded as determining which was all round the best method. For this yet further investigation would be needed. Moreover, in the experiment as described, we have entirely neglected the relation of reading to writing, and it would remain an open question whether the method found best for reading in itself were also the best when reading and writing are taught together or in close connection. Nor again would it necessarily be the best for children whose interests lead them to learn to write first, though this is probably not unusual where the pupils are allowed to follow their inclinations in the matter and are not bound by school tradition.

4. In all experimental work in education the assistance given by mathematical and statistical science is invaluable. The determination of the probable reliability of the results and the grouping of data so as, on the one hand, to avoid suggesting unwarranted inferences, and on the other, to secure that the information shall be put in its most useful and convenient form, are an essential part of the experiment. Moreover, experiments must be

devised so that exact results can be expected. The vague work of classifying data which is merely subjective, i.e. data to which competent observers may readily give different values and for which there is no objective standard, may be suggestive but can seldom or never yield reliable results. We have already pointed out some of the difficulties of devising suitable tests for reading, and in most other experimental work similar difficulties arise. A composition, for instance, can be accurately marked for the number of words wrongly spelled or for the number of mistakes in grammar, but some of the mistakes may be much less serious than others, and yet it is difficult to find an objective standard for measuring this. The estimation of style is still more difficult, although it is clear that classification by words—excellent, good, fair, and so on—is merely a subjective standard, and that there will be serious risk of error on the marginal cases. In many cases indeed several preliminary experiments will be necessary in order to show exactly where failure in the accuracy of the methods used is likely to occur and also to show what exactly it is possible to test by experiment if accurate results are desired.

The knowledge of statistical methods required both to conduct experimental work successfully and to criticise it is indeed still a pitfall to the amateur experimenter and critic. Even such words as 'average,' 'median,' 'percentage,' are sources of confusion, and some inclusion of the elements of statistical science in the recognised school training in mathematics is much to be

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desired in view of the growing importance of the subject in this and many other connections.

One other point of interest in connection with experimental psychology and its applications to education is its value as an introduction to the study of general psychology. The working of simple experiments, many of which can be carried out without special apparatus, provides excellent practice for the student in the analysis of mental function. And, where the experiments can be worked by a class, the differences in individual results are often specially suggestive. Such introductory work appeals to many students to whom a book on theory would seem dull and perhaps incomprehensible, and after the conclusion of the experiments they will be ready to work back to the theoretical side along lines of interest and understanding already aroused. For teachers especially such work is of extreme value in view of the constant discussion of experimental work in schools. Some knowledge of actual practical work is the best safeguard against over-credulity in accepting half-proved results, and against rashness in attempting experiment with inadequate knowledge of method. Experiments in school may, of course, be valuable in addition to such class study if it be clearly recognised that the results obtained by unpractised experimentalists are seldom of value in themselves.

CHAPTER VII

SPECIAL STUDIES IN CONNECTION WITH MEMORY

THE concept 'memory' has undergone as many changes recently as perhaps any other used in psychology. The word itself has survived, like many useful terms, from a time when much that we now know to be complex was believed to be simple, and when memory was understood as that faculty of retaining and recalling the past which in some people was 'good,' and in others 'bad.' Few writers now dare to use the word in the singular without hastening to explain that they mean not 'memory' but 'memories,' and that they are well aware that such a statement as "John has a good memory" is meaningless unless we say to which of John's memories in particular we refer. Thus we must distinguish rational or logical memory from rote memory, visual memory from auditory memory and from all the other memories connected with the specific senses. In addition we have a memory of one type connected with one subject in which perhaps we are interested, whilst in other subjects our methods of recall are different and perhaps less effective. Finally, we can speak of specific memories

connected with different kinds of objects, the concrete, the abstract, numbers, colours, shapes, and so on.

It is a fact well known to teachers that children's memory power varies according to the subject matter they are trying to recall, and the same point can easily be verified by introspection. Each person, whether child or adult, usually remembers best the things in which he is most interested. For one thing he tends often to think of these things, so that his knowledge is frequently recalled and thought over, and thus becomes more readily available. Again, his interest leads to the formation of fresh associations, so that the possible links of recall are increased and his command of the subject becomes greater. The processes of observation of fresh matter and of recall of what was previously known both work most readily along the lines of interest. Hence that specialisation of attention and interest which we have already discussed leads also to a specialised memory which is likely to be relatively effective, whereas often the memory for subjects outside the individual's dominant interests will be proportionately poor. A 'good' memory as a rule means good in respect to the person's chief interest, or perhaps his work, where the power naturally attracts most attention, whilst the weakness or inaccuracy of memory in other directions is apt to be overlooked.

Selective attention, which depends largely on the ideas already existing in the child's mind, and his consequent power of understanding new facts presented to him, determines what exactly is retained out of the numerous

possibilities offered to him. Teachers occasionally complain, in reference to such a subject as history for instance, that the children remember the minor personal details and little stories by means of which they fondly believed that they had made the lesson so interesting that all the important facts must necessarily be retained. But such disappointing results are inevitable where the 'facts' are so uninteresting to the child or so badly presented as to require such a garnish to make them 'go down.' The child naturally remembers that part of the lesson which appeals to his existing interests and is suited to his stage of development. If his mental content is such that the story of the cakes, for example, is within his grasp, whereas Alfred's struggle with the Danes is not, he will remember the former and forget, or rather never really apprehend, the latter. Nor can the teacher avoid the difficulty by leaving out the cakes and confining himself to the Danes, for then he may find that most of his class remember nothing at all, or remember in such a confused way that they had better have forgotten. Such difficulties arise from a bad selection of subject matter, perhaps in this case owing to undue reverence for a text-book type of fact. Of such facts some teachers unfortunately still feel that all children must learn a certain minimum, to ensure which they begin teaching them when the child is too young and when they are unsuited to his existing interests. The teacher may be partly comforted for the child's forgetfulness by the reflection that no historical fact is important enough to children to be worth a coating of

irrelevant matter to secure its retention, and may rest assured that the child is better for the present with Alfred and the cakes as one of his many stories, or even better still without Alfred at all. To some extent, indeed, what a child readily remembers is a test of what he is fit to be taught or to be allowed to learn. Many children are capable of an intelligent interest in history at an age when others can only remember the garnish of tales: many more can be easily stimulated to interest in social life and in, say, the more exciting battles. The rest should be allowed to remain at the story stage for a time so far as history is concerned.

Not only, however, does the power of memory vary according to the subject matter to be recalled, but memories also vary in type. These types or methods of recall are connected with mental imagery. As objects present themselves to us they stimulate various sense organs. When we see a flower, for instance, we may also smell and touch it and our recollection of it may be in the form of a visual image of the appearance of the flower, of an image of its smell, or of an image of its feel, or we may be able to recall it by all three images. In other cases we may have an image of a taste, an auditory image of a sound, a kinaesthetic image of the muscular sensations involved in making a certain movement, and so on. Most people seem to have one type of imagery which they use more readily and frequently than others, but they can often produce other types when they make any effort to do so, and may also pass from one type to another without effort, according to

changes in the subject matter they are trying to recall. Thus a person who relies mainly on visual or auditory imagery in repeating an English poem silently will at once use kinaesthetic imagery in changing to a French or German one. In this case, no doubt, the extra care and attention given to pronouncing the foreign sounds when the poem was learnt have caused the memory of the muscular sensations to be retained here, whilst it is lost in the case of the English poem.

Moreover, a person whose imagery is weak in certain directions can apparently improve it by practice, i.e. by conscious efforts to recall objects in that particular way. Hence any attempt to classify people according to the type of imagery they most readily employ is apt to be misleading. Again, it is doubtful whether any general statement, such as that abstract thinkers have not as a rule much power of visual imagery, is legitimate at present.

Imagery of all the types varies widely in vividness and accuracy in different individuals. Visual images, for instance, vary from a clear, detailed and properly coloured picture to a blurred greyish one. It is the same with imagery connected with the other senses. Some individuals, for instance, have complex auditory images of, say, orchestral music, in which the different instruments can be distinguished ; others cannot even image a simple tune or phrase. In fact study of the subject has revealed a multitude of unsuspected individual differences in the kind and quality of imagery, unsuspected because everyone naturally supposes that his own type of imagery is

the normal one until he discusses the subject with other people. Even after such discussion it is difficult for anyone who, say, habitually employs visual imagery to imagine what thought may be like without this accompaniment, though he must perforce believe in its existence.

It remains, then, to consider some of the uses of these memory images. In some cases, of course, the image is itself what we want to recall and its vividness and accuracy measures the effectiveness of that particular memory. Thus auditory or kinaesthetic imagery seems essential to the recall of a tune, and both usually play an important part in remembering words in a foreign language. The modern reliance on phonetics in language training is the outcome of a recognition of the value of kinaesthetic memory in enabling us to reproduce sounds. Even quite young children can be interested in the position of their lips and tongues when speaking, and can be helped to correct pronunciation through this interest.

Visual memory also has obvious uses. Some people can picture whole pages of a book or of lecture notes, and can thus practically read off what they wish to recall. Others habitually make a visual image map of their town or district, and can readily find their way about in streets which are themselves unfamiliar by the help of known positions fixed on this map. Others make use of images of geometrical figures or of numbers in solving problems, and children of mathematical tastes sometimes use this facility to occupy themselves when they are bored with

lying awake at night. Others again can image more or less definite charts of historical events by the help of which they readily place any given event in its proper setting.

Even vague imagery of various kinds may be valuable, and teachers should be on the look out to encourage all available forms. But it is important to remember that some of the most serviceable images, according to introspective evidence, are not *reproductive* of anything actually seen, but constructive, i.e. made up out of combinations of known elements. Thus in the case of one observer the visual image map referred to above consists, in regard to London, of a series of vague images of the appearance of certain well-known streets placed roughly in position something after the fashion of an old pictorial map, with blurs in between for the less familiar or less striking streets. In this case the appearance of the streets is of course reproduced, but their arrangement in position, so as to give a kind of bird's-eye view, is constructive. This image never appears as a whole, including all a known portion of the town, but only in sections ; the relative position of these is, however, generally remembered, and considerable discomfort is felt in unfamiliar districts until the visual 'map' can be mentally constructed and placed in correct position in reference to something already known. It may be noted that visual images of the street map habitually used are seldom obtained, and are in any case too vague to be of much use. A teacher could hardly help directly in the formation of imagery of this kind, whose practical value is nevertheless obvious.

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Imaged history charts are apparently apt to bear the same individual constructive character, and are often not reproductions of any chart actually seen. Whether the use of a wall history chart in school would help or hinder the formation of such individual types of imagery is at present doubtful, but it is probable that many children who can form no imaged chart for themselves will be able to reproduce the one frequently used and to adapt it to their own purposes.

Various interesting points concerning the development and value of mental imagery await further investigation, but for the present it seems reasonable to conclude that the class teacher should seek help from all suitable types as opportunity offers. Children should be encouraged to see, hear, touch and do, whenever possible, so that they may not have to depend on one type of image alone. The muscular activity of 'doing' is especially valuable not only because of the possible value of the kinaesthetic imagery thus obtained, but because it generally demands more prolonged and careful attention on the part of the child and may thus help other forms of memory as well. This is the case, for instance, when a child writes a word in addition to seeing it written or spelling it aloud.

So far we have considered only those memory images which serve a definite purpose, but thought processes are usually accompanied by much imagery, which is more or less irrelevant and may even hinder the formation of clear ideas. This imagery is often due to associations formed when the particular fact or event of which we

are thinking was first presented to us, or which have grown up by constant or specially vivid presentation of an object in a particular form. The words Justice, Love, are apt to call up in the minds of visualisers the images of a draped, blindfolded figure holding scales and of a naked boy with wings; images evidently due to familiarity with certain pictures. These associated memory images may sometimes give a misleading or ludicrous colour to the thought, as often happens in the case of imagery connected with hymns which we learnt in childhood and only half understood. Often they are merely irrelevant, occasionally they are suggestive, or again they may prove an insurmountable obstacle to the formation of new constructive images in connection with the subject. One observer, for instance, states that she is often hindered in constructing images of scenery described in a book by the persistence of a mental image of the map of the country referred to. Something of this sort happens when we try to recall a certain tune and find ourselves always lapsing into another which contains a similar phrase. For a like reason many people object to reading an illustrated novel because the pictures when once seen persist in memory and prevent them from constructing their own images of the characters and scenes. Teachers need to be prepared for this more or less irrelevant imagery in children, since it often lends an unexpected colour to the subject matter of the lesson.

More important for teaching purposes, however, is the part played by the child's stock of memory images

in forming new constructive imagery of things described or read about. This stock can be usefully increased by letting the children see good pictures, just as it may be spoiled by familiarity with poor ones, and its possession may considerably enhance their powers of literary appreciation, their understanding of books of travel, their enjoyment of history, and so on. Frequent demands are made in school on this ability to construct images, and teachers are apt to over-estimate what children can do in this respect, because they forget that all such imagery must be based on past experience. The child must have in his memory the ingredients, as it were, of the picture he is to make up in order that the description may enable him to group these together. And it is well to remember that if the child is interested, which we may presuppose, he will not be beaten by lack of suitable ingredients but will construct some sort of image, the misleading nature of which may never be discovered unless his confusion leads him to make some absurd mistake. For the most part children attach more meaning to a description if it is connected with and essential to some action. Indeed even adults generally get a better idea of a country from reading an interesting book of travel than from a descriptive geography. The time taken to cross a forest, the exhaustion after an hour's walk in soft snow, the rescue of sledge dogs from a crevasse all give at least a fairly correct working notion of the things described, and of their effect on practical problems. Good constructive pictures, based on description as such, are formed with difficulty even by adults who habitually

visualise, but descriptions connected with action are readily appreciated even where visual imagery is weak.

Apart from the recognition of different types of memory image, experimental work has led to much interesting analysis of the functioning of memories. In the first place, we must distinguish primary or immediate memory, that is, ability to recall a thing immediately after it has been learnt, from memory in the more ordinary sense which involves retention. Immediate memory appears to be decidedly weaker in children than in adults, and it is well known that children who are otherwise intelligent often have difficulty in repeating the exact words of messages when asked what they have been told to say. Binet makes use in his intelligence tests of the fact that this immediate memory strengthens as children grow older, by requiring them to repeat several figures, or a short sentence, immediately after hearing them said. On the other hand, children retain what they have learnt rather better than adults, and the retentive powers appear to reach their maximum efficiency at the age of thirteen or fourteen. But it is also necessary in respect to children, to distinguish special memories for certain classes of objects. Thus memory for concrete objects, numbers, abstract words, and so on, varies at different stages of development, as indeed we should expect from the close connection between memory and interest. The child learns more slowly than the adult, and in addition he learns certain things more slowly at certain stages of his growth. There is also some evidence to show that good physical development tends to coincide

with good immediate and retentive memories. It appears, too, that children have not specially good rote or mechanical memory as distinct from logical memory of subject matter that is clearly understood. Apparent improvement in the retentive powers of a given individual, apart from that due to natural growth or to increased interest in the subject matter, seems to resolve itself mainly into improved methods of learning, a more reasoned presentation of subject matter, the formation of suitable associations, and so on. Most of these, in the case of children, depend on the teacher, so that it is along such lines that attempts may be legitimately made to improve the pupils' memories. But the old-fashioned belief in the excellence of children's memories must in the main be given up. It may have arisen partly from their slightly greater native retentiveness, but was probably due in the main to the fact that constant more or less mechanical 'learning by heart' was insisted upon in schools to an extent to which no adult would submit, so that no standard of comparison for the memories of adults and children was available. Indeed, considering the time occupied by such learning and by frequent repetition, the amount that the children remembered was, in fact, less surprising than the amount they yet managed to forget. In reality some part of the supposed fixity of things learnt in childhood depends on the fact that we have been fortunate enough to learn things which we have frequently used. Few people forget the alphabet or the multiplication table, but many of us forget the hymns we learnt as children, and

those of us who cease to read history forget the 'dates' we used to reel off by heart. These considerations and the time taken up by memory work should make educators cautious in advocating much learning by heart in schools. Care should be taken to select only such things for learning as are likely to be useful or pleasant as a possession throughout life, and in allotting the memory work to different periods of the child's time at school teachers should take into account all available evidence as to the age when special memories for different types of subject matter are likely to be most effective. The learning of things whose frequent usefulness is doubtful may for the most part be left until they are actually needed, or at least may be demanded only from children whose memorising or retentive powers, or both, are specially good. Thus most historical dates, many geographical 'facts,' all but the most useful mathematical formulæ, irregular verbs in foreign languages—to mention a few of the things frequently memorised in schools, may in general be treated in this way. Some of them will be memorised unconsciously as they occur in ordinary school work, and the rest may be learnt later on if and when they are needed. They will indeed be learnt more rapidly and intelligently because they are needed for a purpose, and even if they are sooner forgotten they will probably be retained long enough, i.e. as long as the learner is working at the particular subject in question. The learning of poetry by heart can of course be justified on the ground that its knowledge is a pleasant and valuable possession, akin to the musician's ability to

play without notes. But it is unlikely to be a pleasant possession except to such children, and they are usually in the majority, who take genuine pleasure in learning poetry.

Much learning by rote in school has until lately been advocated on the ground that it 'trained' the memory—a particularly attractive aspect of the theory of formal training. This contention has been made the subject of investigation of a number of experiments. The results of some of these, or at least the inferences based upon them, have been conflicting, but the most recent series, those conducted in London by Sleight, seem to give good ground for denying any transference of memory power, as such, from one subject to another. In brief, practice in memory work in one subject, though of course we may expect improvement in this particular subject, will not cause improvement in learning other material, even when this is somewhat similar to that used for practice, unless the learner consciously or unconsciously applies better methods of learning to the second task, because he has used them during the practice. His memory, as such, will not improve, but his intelligence in setting to work may. In fact he may acquire a serviceable concept of method which he can apply in learning different material. To make use of rhythmic intonation in learning may be given as one illustration of a simple concept of method, another, much neglected by children, is to obtain a clear understanding of the subject matter to be learnt before attempting to memorise it. This view will be welcome to the intelligent teacher, who is

thus freed from the responsibility of urging continual rote learning upon his pupils, whilst numerous possibilities of helping them to acquire rational methods of attacking their work will suggest themselves to him.

CHAPTER VIII

SPECIAL STUDIES IN CONNECTION WITH ADOLESCENCE

THE phenomena connected with adolescence have received much attention during recent years and their study now almost forms a special branch of educational psychology. Stanley Hall's work on the subject is probably the best known, but in addition to his books there are numerous others which treat the subject from various points of view and employ various methods of study. Some of these are based on answers to *questionnaires*, a plan which has been more popular in America than in this country, and the results of which, while often intensely interesting and suggestive, perhaps tend to accentuate the more exciting but probably more abnormal phases at the expense of those comparatively dull experiences which may nevertheless be commoner. Others again are based on evidence gathered from special knowledge of adolescents in schools or in boys' and girls' clubs. The latter type of evidence is often particularly interesting, since the boys and girls observed are no longer under the restraint of school discipline, and their tendencies and needs are consequently more freely expressed. The

absence of restraint also shows up more vividly some of the dangers of adolescence, which if not wholly guarded against in school, are at least thrust under the surface. Other studies, and these by no means the least valuable, take the form of the biographical novel of which *Richard Feverel* may be instanced as the classical type, or of autobiography.

The practical outcome of these numerous studies is, however, somewhat depressing for the teacher. The result of his reading may be to leave him on the one hand with a perhaps salutary sense of the dangers of the adolescent period, and on the other with a sense of his own powerlessness to deal effectively with the problem, since indeed it often seems that it is the influence of the boy's or girl's contemporaries that counts at this stage rather than that of his elders. Some suggestions and hints, both positive and negative, can, however, be gathered, and it is the purpose of this chapter to summarise these while at the same time giving a brief description of the characteristics which are held to mark off the adolescent stage from those which precede and follow it.

The age boundaries of adolescence are ill-defined, and vary, not only as we should expect, in different races and under different climatic conditions, but also in different individuals of the same race and living in the same country. Roughly speaking, for English children we may expect adolescence to begin about the age of twelve or thirteen and to end, at least in its most marked form, about nineteen or twenty. But some writers

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trace the influence of sexual preoccupation back into earlier childhood, and some of the characteristics of adolescence persist under favourable conditions, as, for example, at the Universities, through the first years of the twenties. Physiologically, the age is marked by the development of the sex organs and of the secondary sex characteristics. In both sexes a certain instability in physical strength and development is the result. Both are specially liable to acquire certain diseases, such as tuberculosis, and both seem to alternate physically between periods of unusual energy and well-being, and periods of inertia and slackness. This points to a less rigid school discipline and to a sympathetic recognition of the fact that the same ground may be covered by fits and starts as well as by steady application. At the same time there is risk of over-pressure, both in school work and in games, and for this both teachers and parents have to be on the look out. But a mechanical plan of urging forward the slack and pulling back the keen may be merely stupid and lead to unnecessary friction in many cases. In the main, however, these physical questions are matters for the doctor rather than for the teacher or parent, who need rather to provide themselves with the necessary medical advice in any doubtful cases than to form theories of their own on the subject.

The mental and moral characteristics of adolescence are naturally in large measure interdependent with the physical, but their treatment is more particularly the responsibility of the educator, who therefore needs to study them more carefully.

1. In the first place, there is the development of the sex instinct and its emotional effects. Civilised peoples have to face the fact that this instinct appears long before its direct satisfaction by marriage is either possible under existing social conditions, or it would appear even physiologically desirable. Luckily the sex instinct appears particularly well fitted to act as a driving force in a variety of directions. It may find outlets in boy- and girlhood and in early man- and womanhood in poetry, painting and all forms of art, in the preparation for a career, in a general thirst for knowledge, whether of books or through experience, and in the energies of the social reformer. In fact the force of the sex-impulse seems to overflow into and strengthen most of the other instinctive tendencies, and to find some of its most valuable expression through them.

A much disputed problem which arises in connection with the sex instinct itself is how and when children should be instructed in sex hygiene, the functions of the sex organs, and other kindred subjects. The older plan of drawing a veil over all such matters, hushing up all discussion and questions about them and leaving it to chance and the child's companions when and what he learnt to understand is now generally admitted to be unsatisfactory. The system was perhaps effective in keeping such knowledge from girls in the upper and middle classes when home education was commonly the rule. Healthy and well-occupied girls sometimes remained surprisingly ignorant until after they grew up, a few were even left criminally ignorant until they married.

But in most cases the result was not ignorance but knowledge gathered stealthily as a forbidden thing, and often picked up from contemporaries or half-educated elders who neither understood the child's needs nor cared in what form the information was put. Anything connected with sex was thus looked upon as half improper and half a joke, and the element of secrecy added zest to both these aspects. Few people would care to let religious knowledge be picked up by children in this haphazard way, and there seems no reason why the question of sex, whose importance no one denies, should be treated less conscientiously. In fact the objection to giving the child all the knowledge he seeks, and indeed encouraging him to seek it, is based on the feelings of the adult rather than on regard for the welfare of the child. The knowledge will not hurt him, but it may frequently embarrass his elders to give it, and his subsequent remarks will almost certainly be at times disconcerting to those trained under the earlier system of mystery. Moreover, few of us, brought up as we have been, are able to talk to children as freely and naturally as is desirable, and our conscientious efforts to overcome embarrassment may make matters worse. Nevertheless the effort is worth while.

The question remains when and how the information should be given. The answers to this have been various enough. Some writers say that the matter should be approached through a study of plants and animals, and this certainly works well with many children. It is indeed probably the best for those who have to learn

these things, if at all, in schools, since the subject is thus taken in the ordinary course and the teacher is provided with a straightforward method of approaching the topic. In many cases, however, the child's interest is aroused in the human aspect of the question, as, for instance, by the birth of a younger brother or sister, before he takes any interest in that side of plant and animal life. In such cases the only plan seems to be to give frankly such explanations as the child can grasp as soon as his curiosity is aroused, and subsequently to encourage occasional conversations on the subject and to answer questions readily. It is also desirable to follow up the knowledge of human functions thus gained by some study of plants and animals, so that the child may get some idea of the interconnection of things. The task is difficult enough, as anyone who has attempted it will readily acknowledge, and the child's questions are at times impossible to answer in any way that it can really understand. Still the point is gained that he learns to ask questions instead of brooding over his puzzles, and that he gains enough knowledge to save him from the shock of an ill-timed discovery later on. All this applies to young children from the age of five onwards. Later on, at the age of twelve or thirteen, some teaching in sex hygiene is probably advisable as a direct preparation for adolescence. This is sufficiently easy, since the ground has been already prepared, and it may even be done by the provision of a suitable book for the boy or girl to read.

2. In the second place we may note the widening and intensifying of the instinct of curiosity. This

instinct combines with the spirit of adventure and the desire to do and experience on the one hand, and with the growing intellectual power on the other. The result may be an intense interest in books, especially, owing to the attraction of the personal element, in biography and history. Or it may be an eagerness for scientific work. Some boys run away to sea, others devote themselves to games. In nearly all cases we find, temporarily at any rate, a marked development of independent thought and of the critical faculty. Everything must be tested by the adolescent's own knowledge and experience. He takes nothing on trust, and is often embarrassingly unwilling to accept the opinions of his elders. At the same time he is equally open to suggestion from those whom he loves and admires. Unfortunately, too, where suitable outlets for his intellectual and other energies are not available, he may end in wild revolt against authority and sometimes in crime.

3. Thirdly, the social instincts are accentuated. The adolescent is amazingly and genuinely altruistic in his theories and is intermittently unselfish in his practice. He now, in fact, begins to form those abstract sentiments which were rare or impossible in his earlier years. His intolerance is partly due to the width of these sentiments. His justice, his truthfulness and his patriotism admit no compromise and allow no compassion for the individual who fails to live up to the universal standard. He readily forms such ideals, or accepts them from his friends, and many of us, like the hero in *Tono Bungay*, look back with half-respectful admiration on our youthful ideals

and sentiments and capacity for self-sacrifice. Nor can we help regretting, in spite of its uncomfortable results, our adolescent scorn of the feeble compromises of later life.

Widening social ideals are often connected with love and friendship for elders and contemporaries of either sex. The adolescent reads into his hero all the qualities that he most admires, and it is sometimes a comfort to those who look on that the influence of even a poor sort of hero may be much better than his actual character justifies. Friendships, which provide opportunities for the discussion and exposition of all kinds of theories and beliefs, are perhaps one of the most important means of education at this stage and are certainly the least provided for, indeed they are often discouraged owing to fear of possible evil results. But the effect of the discouragement of reasonable human intercourse is to reduce the adolescent to a sort of solitary confinement in a crowd, and to leave full scope for the more sentimental admirations which flourish wherever human beings live together without proper opportunities for genuine companionship. Moreover friendship offers a natural outlet for ideas which might otherwise become morbid, and is likely to prove a corrective to the adolescent's tendency to think himself abnormal and peculiar. And again, to guard against possible sentimentality and moodiness by occupying the boy or girl perpetually, though it may serve to deaden idiosyncrasies and may be necessary in some abnormally developed cases, is for the most part a method of saving trouble to the educator rather than a

real solution of the problem. Given a suitable environment and suitable help and teaching the adolescent will occupy himself eagerly enough. But in addition to this he needs time for thought and even for occasional brooding or moodiness, as well as time for friendship, if he is to attain his fullest development. And the boy or girl who passes through adolescence without time for these things is so far the poorer and more humdrum for the rest of his or her life. As in other human enterprises, something must be risked in order to secure the best.

4. Fourthly, the constructive or creative instinct is normally reinforced and widened and should be available to supply the boy or girl with some means of self-expression. Self-expression is generally recognised as an important need in young children. It is no less important for the adolescent, but until lately this has been little realised and even now but small provision is made for it in ordinary school life. Most of the forms of expression which have proved valuable in the history of the race will prove valuable now. The utilitarian arts, such as carpentry, cookery and needlework, play their part, but in addition the adolescent should have had sufficient practice and training in drawing, painting, modelling, writing poetry and prose, dancing and music to enable him to turn to one at least of these to express himself and to satisfy his emotional needs.

In the past instruction in these arts has been too mechanical and too much designed to develop technical skill to prove effective for any but a few exceptional pupils. What is needed is a continuance of the free

expressive art of children, supplemented by such help in technique as the pupil himself feels the need of. The picture or model should always be something that he himself wishes to draw or make, and it should be judged, if judgment be necessary, not as an imitation of reality, but for its freedom and vigour of form or colouring. In music and dancing great advance may be hoped from the work of Dalcroze and others in eurhythmic training. This may not only lead to widely increased pleasure in and appreciation of rhythm in all its forms, but may help those who lack time or opportunity for special study of music to find a means of expression for latent musical ability.

In all cases these arts should be taught frankly and avowedly as a means of giving pleasure to the 'artist,' and it should be acknowledged that the quality of the work is a minor consideration since genuine artistic ability will probably always be rare. This change of standpoint need involve no greater demand for time in schools. Indeed it may result in a decreased demand since, if the method be successful in its aim, the children will take a sufficient pleasure in their productions to find their own time for a great part of the work, and will carry it on naturally into their adolescence when it is more particularly needed as a means of self-expression.

5. Finally the adolescent, boy or girl, is proverbially 'difficult to manage.' It is not so much that he is in-subordinate, though that too may be the case, as that he subordinates himself blindly to his own chosen leaders and ideals, and that these are frequently not the leaders

or ideals approved of by his parents and teachers. It is in this connection that we see the danger referred to in a previous chapter, of a discouragement of reasonable discussion about problems of religion and morality. Where the child has not been used to friendly discussion the boy and girl will certainly shun it, with the result that they must be left to fight their own mental and moral battles without aid unless from their contemporaries, whose views are probably no less chaotic than their own. Much of adolescent discipline should, indeed, be foreseen and prepared for throughout childhood. It might then generally, as in some rare cases it now does, consist in a frank and friendly admittance of the boy's right to his own views and, above all, an increased freedom in many directions, with its attendant responsibilities. And the more the boy has been practised in the right use of freedom in his childhood the less likely is he to abuse it now.

Moreover, elders must beware of rashly running counter to the instinctive impulses which are now so strong. Parents, for instance, seem often blissfully ignorant of the storm of passionate anger and even hatred which they may arouse by foolish criticism of their children's friends. Yet disagreement on this point is not infrequently the origin of a more or less serious and permanent estrangement.

The temporary instabilities which lead to 'adolescent crime' must also be noticed in connection with discipline. How frequent these are it is at present difficult to determine, but it is clear that, for instance, tendencies to kleptomania and various forms of burglary are common

enough and passing enough to deserve lenient treatment when they are discovered. In some cases the boy or girl 'idealises' the crime and pictures himself as a sort of hero of romance. In other cases he is bitterly ashamed of the impulse, to which he yet feels forced to yield. Still more serious is the tendency to suicidal mania, probably far more common than is apparent, and due sometimes to excessive self-depreciation and oversensitiveness, and sometimes to a specific disappointment or grief. In only exceptional cases probably is it actually dangerous, more often it is merely paralysing. But in all its forms it seems responsible for a genuinely intense misery, from which some boys and girls at any rate might be saved by a more sympathetic treatment.

In conclusion we may insist on what has already been implied that the sort of dicta found in some educational books, such as "keep the adolescent fully occupied," "cultivate the normal," "guard against all tendencies to morbid development," while they seem to follow the dictates of common sense are somewhat lacking in imagination and in a full understanding of the problem. Adolescence is the one brief period of our lives when each one of us apparently has the chance of being a little of the genius, a little of the artist and a little of the hero. Such dicta, if they could be strictly carried out, would deprive our children of some of the most glorious and most fundamentally profitable moments of their lives.

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